

31



Transport
Canada

Transports
Canada

FROM: ROUTING SYMBOL

DE: SYMBOLE D'ACHEMINEMENT

RAXI

Transport Canada
1100 - 9700 Jasper Avenue
Canada Place
Edmonton AB T5J 4E6

CB 2913.06.24

EXPIRES-2014/05/31-T2E-63-41246973
AERO DESIGN LTD.
9888A MALASPINA RD
POWELL RIVER BC V8A 0G3

Canada

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PRIÈRE D'INDIQUER VOTRE SYMBOLE D'ACHÈNEMENT SUR
TOUTE CORRESPONDANCE



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United States of America
Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

IMPORT

Number SR03283NY

This certificate issued to AERO Design Ltd.
2013 39th Avenue North East
Calgary, Alberta T2E 6R7
Canada

certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of C.A.R. 6/Part 27 of the Civil Air/Federal Aviation Regulations.

Original Product Type Certificate Number: H2SW

Make: Bell Helicopter Textron Canada Limited

Model: 206B, 206L, 206L-1, 206L-3, 206L-4, 407

Description of Type Design Change:

1. Installation of Cyclic Stick Control Friction as a direct replacement for Bell Cyclic Knob and Shaft Assembly in accordance with AERO Design Ltd. Installation Drawing 95201 Revision 0, dated October 25, 2012 per the AERO Design Ltd. Document Control List DCL952-1 Revision 0, dated November 28, 2012, Transport Canada approved November 30, 2012, or later Transport Canada approved revision.
2. AERO Design Ltd. Rotorcraft Flight Manual Supplement FMS952.91 Revision 0, dated October 26, 2012, Transport Canada approved November 30, 2012, or later Transport Canada approved revision, is required with this installation.
3. AERO Design Ltd. Instructions for Continued Airworthiness ICA 952.90 Revision 0, dated October 25, 2012, Transport Canada accepted November 29, 2012, or later Transport Canada accepted revision, is required with this installation.

Limitations and Conditions:

1. The Installer must determine whether this design change is compatible with previously approved modifications.
2. If the holder agrees to permit another person to use this certificate to alter a product, the holder must give the other person written evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: December 12, 2012


Date reissued:

Date of issuance: June 5, 2013

Date amended:



By direction of the Administrator,


(Signature)
Gaetano Sciortino
Manager
New York Aircraft Certification Office

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

Your file Votre référence

June 20, 2013

Our file Notre référence
C-12-1123
SH12-59

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
Canada, T2E 6R7

ATTENTION: EDWARD BURGOIN – DAR 290M

Dear Sirs:

SUBJECT:	Approval of	Installation of Cyclic Stick Control Friction as a Direct Replacement for Bell Cyclic Knob and Shaft Assembly.
	FAA STC:	SR03283NY
	Aircraft:	BELL 206B, 206L, 206L-1, 206L-3, 206L-4, 407
	FAA STC Holder:	Aero Design Ltd.

Enclosed is the original FAA Supplemental Type Certificate SR03283NY and information concerning your responsibility as a holder of a Supplemental Type Certificate issued to a Canadian Applicant.

FAA STC SR03283NY is based on Issue 1 of Canadian STC SH12-59.

Yours truly,

J. Staal
Engineering Technologist, Engineering
Civil Aviation
Prairie and Northern Region
Phone: 780-495-5227
Facs: 780-495-6659

Encl.

NEW ENGLAND REGION
NEW YORK AIRCRAFT CERTIFICATION OFFICE
1600 STEWART AVENUE, SUITE 410
WESTBURY, NEW YORK 11590

**INFORMATION CONCERNING YOUR RESPONSIBILITY AS HOLDER OF A
SUPPLEMENTAL TYPE CERTIFICATE ISSUED TO A CANADIAN APPLICANT**

This STC is official indications of FAA approval of your installation and may be used to authorize identical installation on other aircraft of the same model, subject to the limitation noted in the STC. It may be transferred, or otherwise made available to another party by means of a licensee arrangement; however, you are requested to advise this office when you transfer or grant licensee rights to the STC in order that we may take the necessary recording or reissuance action.

If you plan to manufacture and sell parts for installation on type certificated aircraft, please review FAR 21.502, which is applicable to parts imported into the U.S.

A copy of the STC and required documents should accompany each kit and installation. Also, your attention is directed to the limitations and conditions specified in the STC.

As recipient of this approval, except as provided in FAR21.3(d), you are required to report any failure, malfunction, or defect in any product or part manufactured by you that you have determined has resulted or could result in any of the occurrences listed in FAR 21.3(c).

The report should be communicated initially by telephone and subsequently in writing to the Manager, New York Aircraft Certification Office, telephone (516) 228-7300, mailing address: 1600 Stewart Avenue, Suite 410, Westbury, New York 11590. This first contact should take place within 24 hours after it has been determined that the failure required to be reported has occurred.

FAA Form 8010-4, Malfunction or Defect Report, or any other appropriate format is acceptable in transmitting the required details.



Gaetano Sciortino
Manager
New York Aircraft Certification Office

SENDER RETAIN THIS COPY / COPIE DE L'EXPÉDITEUR

SENDER ACCOUNT NO. N° DE COMPTE DE L'EXPÉDITEUR 4367155		IMPORTANT - TÉLÉPHONE (403) 250 8027	
SENDER (FROM) / EXPÉDITEUR (DE) AERO DESIGN		MO DY/JR YR/AN 11/08/12	
STREET ADDRESS / ADRESSE (N° ET RUE) 2013 39 AVE NE		APT., SUITE / APP., BUREAU	
CITY / VILLE CALGARY	PROV/STATE/ÉTAT AB	POSTAL / ZIP T2E 6R7	
RECEIVER (TO) / DESTINATAIRE (A) TRANSPORT CANADA			
STREET ADDRESS / ADRESSE (N° ET RUE) 9700 JASPER AVE			
CITY / VILLE EDMONTON	PROV/STATE/ÉTAT AB	POSTAL / ZIP T5J 4E6	
ATTN: (NAME / DEPT.) / À L'ATTENTION DE (NOM / SERVICE) JACK STAAL		IMPORTANT - TÉLÉPHONE (780) 495 52 27	
DESCRIPTION (INCLUDING DANGEROUS GOODS / INCLUANT MARCHANDISES DANGEREUSES) AIRCRAFT PARTS			
SENDER REFERENCE (IF ANY) / REF. DE L'EXPÉD. 0002		PICK UP / CUEILLETTE - N° DE CONF. 0002	

SENDER SIGNATURE / SIGNATURE DE L'EXPÉDITEUR

X

SEE CONDITIONS OF CARRIAGE ON REVERSE / CONDITIONS DE TRANSPORT AU VERSO

X

1746040

MODE / MODE DE TRANSPORT			
AIR AÉRIEN <input type="checkbox"/>		GROUND ROUTIER <input checked="" type="checkbox"/>	
PKG / EMBAL.		SERVICE	
PUR-O-LETTER <input type="checkbox"/>	9 AM <input type="checkbox"/>	9 h <input type="checkbox"/>	
PUR-O-PAK <input type="checkbox"/>	10:30 AM <input type="checkbox"/>	10 h 30 <input type="checkbox"/>	
OTHER AUTRE <input checked="" type="checkbox"/>	SAT. SAM. <input type="checkbox"/>		
PAYMENT / PAIEMENT			
CASH COMPTANT <input type="checkbox"/>	CREDIT CARD CARTE DE CREDIT <input type="checkbox"/>		
RECEIVER OR THIRD PARTY ACCOUNT NO. / N° DE COMPTE DU DESTINATAIRE OU TIERS			
RECEIVER DESTINATAIRE <input type="checkbox"/>	3RD PARTY TIERS <input type="checkbox"/>		
SHIPMENT / DÉTAILS / EXPÉDITION			
#/Nbre PCS (4 MAXIMUM) 1	WEIGHT / POIDS SUBJ. TO CORR. / SUJET À CORR. KG 7 LB 10		
DECLARED VALUE / VALEUR DÉCLARÉE (SURCHARGE APPLIES OVER \$100) (SUPPLÉMENT AU-DESSUS DE 100 \$) \$ NDV \$5,000 MAX. MAX 5 000 \$ SEE CONDITIONS OF CARRIAGE ON REVERSE / CONDITIONS DE TRANSPORT AU VERSO			

BILL OF LADING NO.
-NOT NEGOTIABLE
N° DE CONNAISSANCE
-NON NEGOCIABLE

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COURIER INITIALS INITIALES DU COURRIER <input type="checkbox"/>	COURIER ROUTE ITINÉRAIRE DU COURRIER	MO DY/JR YR/AN 11/08/12
NO./N° TYPE <input type="checkbox"/> VISA <input type="checkbox"/> MC <input type="checkbox"/> AMEX		EXP. DATE D'EXP.

RECEIVER OR THIRD PARTY ACCOUNT NO. / N° DE COMPTE DU DESTINATAIRE OU TIERS	CHARGES FRAIS
	TOTAL AMOUNT / MONTANT TOTAL

THIRD PARTY BILLING NAME & ADDRESS / FACTURATION À UN TIERS (NOM & ADRESSE)

LIMITATION OF LIABILITY - IMPORTANT - PLEASE READ
THE AMOUNT OF ANY LOSS OR DAMAGE FOR WHICH THE CARRIER MAY BE LIABLE SHALL NOT EXCEED \$2.00 PER POUND (OR \$4.41 PER KILOGRAM) COMPUTED ON THE TOTAL WEIGHT OF THE SHIPMENT UNLESS A HIGHER VALUE IS DECLARED ON THE FACE OF THE BILL OF LADING BY THE CONSIGNOR (SENDER). MAXIMUM DECLARED VALUE SHALL NOT EXCEED \$5,000. N.B. NOTE CAREFULLY CONDITIONS ON BACK HEREOF INCLUDING LIMITATIONS AND EXCLUSIONS OF CARRIER'S LIABILITY, WHICH ARE HEREBY ACCEPTED.

LIMITATION DE RESPONSABILITÉ - IMPORTANT - LISEZ S.V.P.
LE MONTANT DE TOUTE PERTE OU DOMMAGE DONT LE TRANSPORTEUR POURRAIT ÊTRE RESPONSABLE NE DOIT PAS EXCÉDER 2,00 \$ LA LIVRE (OU 4,41 \$ LE KILOGRAMME), CALCULÉ SUR LE POIDS TOTAL DE L'EXPÉDITION, À MOINS QU'UNE VALEUR SUPÉRIEURE N'AIT ÉTÉ DÉCLARÉE SUR LE RECTO DU CONNAISSEMENT PAR L'EXPÉDITEUR. LA VALEUR DÉCLARÉE MAXIMALE NE DÉPASSERA PAS 5 000 \$. N.B. VEUILLEZ PRENDRE CONNAISSANCE DES CONDITIONS AU VERSO, Y COMPRIS LES LIMITATIONS ET EXCLUSIONS DE RESPONSABILITÉ DU TRANSPORTEUR, QUI SONT ACCEPTÉES PAR LES PRÉSENTES.

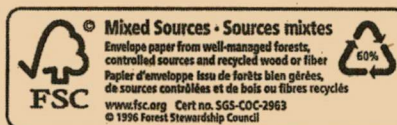
PLEASE REFER TO BILL OF LADING NUMBER FOR SHIPMENT STATUS / INQUIRIES.
POUR TOUT RENSEIGNEMENT, VEUILLEZ NOUS COMMUNIQUER LE NUMÉRO DE CONNAISSANCE.

SENDER RETAIN THIS COPY / COPIE DE L'EXPÉDITEUR

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PRIÈRE D'INDIQUER VOTRE SYMBOLE D'ACHÈVEMENT SUR
TOUTE CORRESPONDANCE



31



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DE: SYMBOLE D'ACHEMINEMENT

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Transport Canada
1100 - 9700 Jasper Avenue
Canada Place
Edmonton AB T5J 4E6



PB
003
120

T5J 4C8 2012

**AERO DESIGN LTD
2013 39 AVENUE NE
CALGARY AB T2E 6R7**



Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
Canada T2E 6R7

Number: SH12-59

Issue No.: 1

Approval Date: November 30, 2012

Issue Date: November 30, 2012

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 206B, 206L, 206L-1, 206L-3, 206L-4, 407

Canadian Type Certificate or Equivalent:

H-92

Description of Type Design Change:

Installation of Cyclic Stick Control Friction as a Direct Replacement for Bell Cyclic Knob and Shaft Assembly.

**Installation/Operating Data,
Required Equipment and Limitations:**

Installation of the Cyclic Stick Control Friction to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL952-1, Revision 0, dated 28 November 2012.

Transport Canada approved, AERO Design Ltd. Flight Manual Supplement FMS952.91, Revision 0, dated 26 October 2012, or later approved revision is required with this installation.

Transport Canada accepted, AERO Design Ltd. Instructions for Continued Airworthiness ICA 952.90, Revision 0, dated 25 October 2012, or later accepted revision is required with this installation.

Basis of Certification: FAR Part 27 including amendments 27-1 through 27-30. (The Bell 407 basis of certification as defined in TCDS H-92).

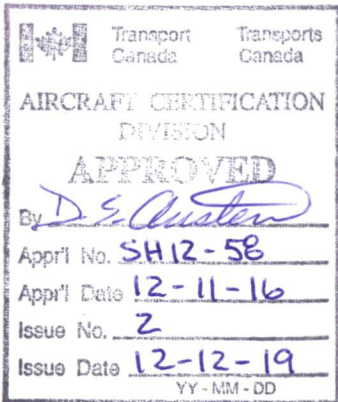
— End —

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.




F.J.B. Wright
For Minister of Transport

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
96901	Fixed Cabin Step Installation	0
96902	Quick Release Cabin Step Installation	0
FMS969.90	Flight Manual Supplement for Quick Release Step	0
ICA969.91	Instructions for Continued Airworthiness	0
FABRICATION DOCUMENTS		
DCL969-11	Document Control List for Step Fabrication	0
APPROVAL:		
 <p>Transport Canada / Transports Canada</p> <p>AIRCRAFT CERTIFICATION DIVISION</p> <p>APPROVED</p> <p>By: <i>D. S. Austin</i></p> <p>App'l No. <u>SH12-58</u></p> <p>App'l Date <u>12-11-16</u></p> <p>Issue No. <u>2</u></p> <p>Issue Date <u>12-12-19</u></p> <p style="text-align: center;">YY-MM-DD</p>	ORIGINAL DATE: 12 December 2012 REVISION DATE:	AERO DESIGN LTD. 2013 - 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 www.aerodesign.ca
	SHEET 1 OF 1	Bell 429 Cabin Steps Installation
	DCL969-1	Rev. <div style="text-align: center; font-size: 3em; font-weight: bold;">0</div>

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
96910	Fixed Step Assembly	0
96911	Quick Release Step Assembly	0
96920	Fixed Step Brackets	0
96921	Quick Release Step Brackets	0
80010	Quick Release Step Assembly (Alternate)	1
80020	Quick Release Step Brackets	0
 ENGINEERING DOCUMENTS		
ER969.01	Engineering Report	0
 APPROVAL:		
 <div style="display: flex; justify-content: space-between; font-size: small;"> Transport Canada Transports Canada </div> <div style="text-align: center; margin-top: 5px;"> AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>D.S. Austin</u> Appr'l No. <u>SH12-58</u> Appr'l Date <u>12-11-16</u> Issue No. <u>2</u> Issue Date <u>12-12-19</u> <small>YY-MM-DD</small> </div>	ORIGINAL DATE: 12 December 2012 REVISION DATE:	AERO DESIGN LTD. 2013 – 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 www.aerodesign.ca
	SHEET 1 OF 1	Bell 429 Cabin Steps Fabrication
	DCL969-11	Rev. 0



Transport
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Transports
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1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

November 30, 2012

Your file Votre référence
952

Our file Notre référence
C-12-0917
SH12-59

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
Canada, T2E 6R7

ATTENTION: TED BURGOIN – DAR 290M

Dear Sirs:

**SUBJECT: SUPPLEMENTAL TYPE CERTIFICATE NO. SH12-59 – ISSUE 1 DATED
NOVEMBER 30, 2012 INSTALLATION OF CYCLIC STICK CONTROL
FRICTION AS A DIRECT REPLACEMENT FOR BELL CYCLIC KNOB AND
SHAFT ASSEMBLY – BELL 206B, 206L, 206L-1, 206L-3, 206L-4, 407
ISSUED TO AERO DESIGN LTD.**

This Supplemental Type Certificate (STC) is issued in response to your application. Included with the STC are the documents bearing the original Transport Canada signatures.

The transfer of this approval document in the name of another person requires the prior approval from the Minister in accordance with Canadian Aviation Regulations (CAR) 521.357.

To accomplish this modification, the requirements of CAR 561 apply if parts are manufactured.

Embodiment of this modification is considered to be a maintenance activity and the requirements of CAR 571.06(4) will apply.

An STC holder is required to report any service problem experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada in accordance with CAR V, Division IX. Other obligations as a Design Approval Document Holder are contained in CAR 521, Division VIII.

Yours truly,

J. Staal
Engineering Technologist, Engineering
Civil Aviation
Prairie and Northern Region
Phone: 780-495-5227
Facs: 780-495-7963


Encl.

Canada

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
95201	Installation Drawing	0
FMS952.91	Flight Manual Supplement	0
ICA952.90	Instructions for Continued Airworthiness	0
 FABRICATION DOCUMENTS		
DCL952-11	Document Control List for Cyclic Friction Replacement Fabrication	0
 APPROVAL:		
 <div style="display: inline-block; vertical-align: middle; text-align: center;"> <div style="font-size: small;">Transport Canada</div> <div style="font-size: small;">Transports Canada</div> </div> <div style="margin-top: 10px;"> AIRCRAFT CERTIFICATION DIVISION APPROVED By <u><i>[Signature]</i></u> Appr'l No. <u>SH12659</u> Appr'l Date <u>12-11-30</u> Issue No. <u>1</u> Issue Date <u>12-11-30</u> <small>YY-MM-DD</small> </div>	ORIGINAL DATE: 28 November 2012 REVISION DATE:	<div style="text-align: center;"> AERO DESIGN LTD. 2013 - 39th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 www.aerodesign.ca </div>
	SHEET 1 OF 1	Bell 206B, 206L Series, 407 Cyclic Friction Replacement Installation
	DCL952-1	Rev. <div style="font-size: 3em; font-weight: bold;">0</div>

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
95210	Friction Assembly	0
95212	Threaded Rod Assembly	0
95220	Parts – Tube	0
95222	Parts – Retainer Bushing	0
95224	Parts – Cap	0
95226	Parts – Crescent Bushing	0
95228	Parts – Curved Washer	0
95230	Parts – Barrel Nut	0
95232	Parts – Threaded Rod	0
95234	Parts – Stop	0
95236	Parts – Stop	0
95238	Parts – Curved Washer	0
 ENGINEERING DOCUMENTS		
ER952.01	Engineering Report	1
 APPROVAL:		
 <p>Transport Canada Transports Canada</p> <p>AIRCRAFT CERTIFICATION DIVISION</p> <p>APPROVED</p> <p>By <u>[Signature]</u></p> <p>Appr'l No. <u>SH12-59</u></p> <p>Appr'l Date <u>12-11-30</u></p> <p>Issue No. <u>1</u></p> <p>Issue Date <u>12-11-30</u></p> <p style="text-align: center;">YY - MM - DD</p>	<p>ORIGINAL DATE:</p> <p>28 November 2012</p> <p>REVISION DATE:</p>	<p>AERO DESIGN LTD.</p> <p>2013 – 39th Ave NE, Calgary, Alberta, T2E 6R7</p> <p>Ph. (403) 250-8027</p> <p>Fax. (403) 250-8333</p> <p>www.aerodesign.ca</p>
	SHEET 1 OF 1	<p>Bell 206B, 206L Series, 407</p> <p>Cyclic Friction Replacement</p> <p>Fabrication</p>
	DCL952-11	<p>Rev.</p> <p style="font-size: 2em;">0</p>

**BELL 206B
BELL 206L Series
BELL 407**

**ROTORCRAFT FLIGHT MANUAL SUPPLEMENT
for the
INSTALLATION of the AERO DESIGN
CYCLIC FRICTION REPLACEMENT**

Canadian Supplemental Type Certificate No. SH12-59
FAA Supplemental Type Certificate No. _____

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 206B, 206L Series, or 407 when fitted with the Cyclic Friction Replacement. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.



Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	3
V	Operating Information	4

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	26 Oct 2012	None		

I LIMITATIONS

No change from basic Approved Flight Manual.

II NORMAL PROCEDURES

No change from basic Approved Flight Manual.

Note: Application of additional cyclic friction is achieved by rotating cam lever aft. See section V for further instructions.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

No change from basic Approved Flight Manual.

NOV 30 2012

V OPERATING INFORMATION

The pilot may increase friction beyond the minimum as set by rotating the cam lever to the closed position.

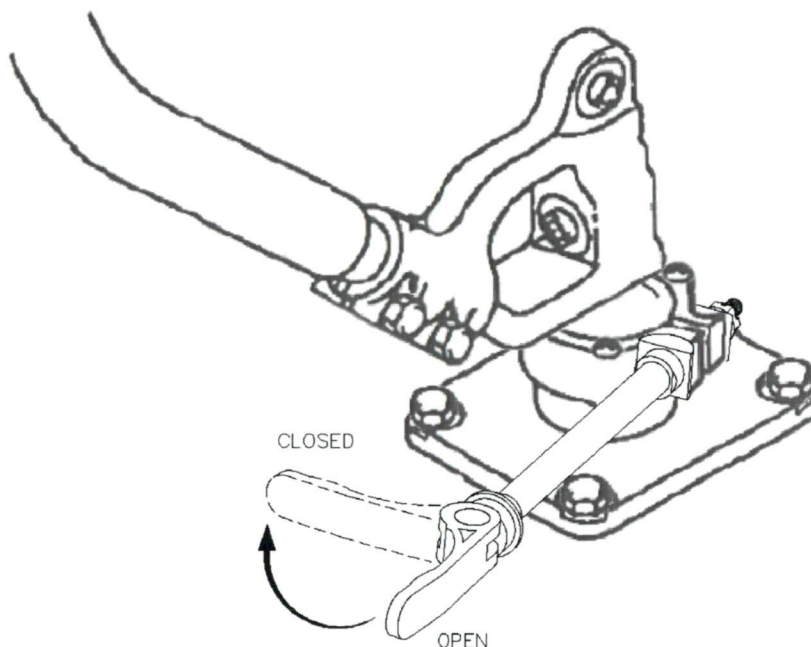


Figure V.1 – Cyclic Friction Operation

To adjust the amount of friction provided by the cam action above the minimum friction:

1. Set cam lever to OPEN position (straight out).
2. Turn lever clockwise to increase friction, counter-clockwise to reduce friction
3. Rotate cam lever to CLOSED position (perpendicular to shaft) to check friction.

CAUTION

Avoid setting the cam lever where the CLOSED position points between the 9 o'clock and 12 o'clock position when looking aft, see figure V.2.

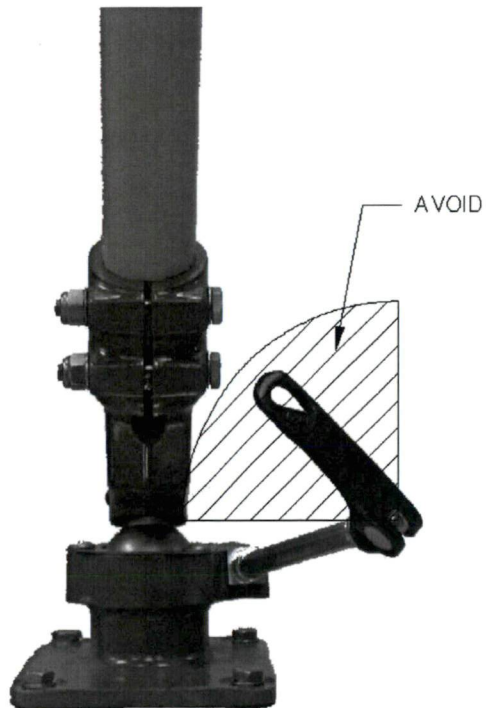


Figure V.2 – Cam Lever Avoid Region
(Looking aft)

APPLICANT: AERO Design Ltd.
2013 - 39th Ave N.E.
Calgary, Alberta, T2E 6R7

ORIGINAL DATE: 27 November 2012
REVISION No. 1

CP952

CORRESPONDANCE TO: AERO Design Ltd.
(If other than applicant) 2013 - 39th Ave N.E.
Calgary, Alberta, T2E 6R7

MAKE: Bell
MODEL: 206B, 206L Series, 407

REGISTRATION: All eligible
SERIAL No.: All eligible

NATURE OF WORK: Cyclic Stick Control Friction

TYPE CERTIFICATE DATA SHEET: H-92

MODEL CERTIFICATION BASIS: FAR Part 27, dated 2 October 1964, including amendments 27-1 through 27-30 except as noted (Bell 407)

MODIFICATION CERTIFICATION BASIS: FAR Part 27, dated 2 October 1964, including amendments 27-1 through 27-30 except as noted (Bell 407)

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart B - Flight					
27.29	Empty weight and corresponding C of G	N/A			No change from Type Approved configuration
Subpart D - Design and Construction					
27.601	Design	Use of conventional design	X		
27.603	Materials		X		
27.605(a)	Fabrication Methods		X		
27.607(b)	Fasteners		X		
27.609	Protection of Structure		X		
27.611	Inspection Provisions	No change from Type Approved configuration	X		
27.679(a)	Control system locks – warning engaged	Statement in report			** No change from Type Approved configuration
27.679(b)	Control system locks – in flight	Cockpit evaluation			**
27.777	Cockpit Controls	Statement in Report			**
Subpart G - Operating Limitations and Information					
27.1529	Instructions for Continued Airworthiness	ICA provided	X		
27.1581	Rotorcraft Flight Manual - General	FMS provided	X		
27.1585	Operating Procedures	FMS provided	X		Instructions provided in the existing Flight Manual are applicable without change. Additional instructions on use of friction are provided. (FMS cleared with F/T)

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 527

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Cyclic Friction Replacement on Bell 206B, 206L Series, 407
Certification Basis of design change and revision date:	FAR 27, Amendment 27-30
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 952.90)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 95201

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 206L/407 Maintenance Manuals, BHT-206B-MM/BHT-206L-MM/BHT-407-MM	Supplemental ICA ref: Single Manual (ICA952.90)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 206B/206L/407 Maintenance Manuals	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-1
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-5

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: Section 67-4
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 27/67	Supplemental ICA ref: Section 67-1 thru 67-3
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: N/A
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: N/A
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: N/A
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A527.4 AWL - Separate Section 1 The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 527.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 4	Supplemental ICA ref: Chapter 4
---	--	---------------------------------

BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.	
Applicants Signature:	Date: 31 October, 2012
Applicants Name: E. Burgoin, P.Eng, DAR 290M	

BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.			
Reviewer's Name: Jack Staal	Phone # 780-495-5227	Email: jack.staal@tc.gc.ca	Mail Routing Symbol: RAED (old) <u>RAXI</u> (new)
Signature:	Date: 29 November 2012		NAPA Number: C-12-0917

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 952.90

CYCLIC FRICTION REPLACEMENT

Bell 206B, 206L Series, 407

Preface

These Instructions for Continued Airworthiness shall be included in the Bell 206B, 206L Series, and/or 407 Maintenance Manual when the Cyclic Friction Replacement is installed in accordance with AERO Design Ltd. Document Control List DCL952, Revision 0, or later approved revision.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0
Date: 25 October 2012

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333
E-Mail: info@aerodesign.ca

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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0			Original Issue

LIST OF EFFECTIVE PAGES

List of Revisions

Revision 0 (Original Issue)

25 October 2012

List of Effective Pages

<u>Title</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	0
Revision Record/List of Effective Pages	2	0
Table of Contents	3	0
00-00-00	4-5	0
04-00-00	6	0
05-00-00	7	0
67-00-00	8-10	0

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 27.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Cyclic Friction Replacement as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness
LH - Left Hand
RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Cyclic Friction Replacement. Requests for a copy may be made in writing to:

AERO Design Ltd.
2013 39th Avenue N.E.
Calgary, Alberta
T2E 6R7
Fax: 403-250-8333
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

Bell 206B helicopters serial numbers 1 through 1657 use a different clamping arrangement for the cyclic friction and are not eligible for this installation.

0-5 GENERAL DESCRIPTION

The cyclic stick control on light Bell helicopters has an adjustable friction device built into the base of the cyclic stick pivot. Two adjustments can be made: a) minimum friction, which is set by the AME, and b) additional friction which can be set by the pilot to suit his preference.

The original design provided by Bell uses differential thread pitches on the cyclic friction shaft to provide clamping force on the cyclic stick pivot ball using barrel nuts. Minimum friction is set by the AME at the time of installation and checked periodically with the inspection schedule for the helicopter. There is no way to limit the tightening force that can be applied by the pilot. Excessive tightening causes significant wear on the threads on the shaft and in the barrel nuts.

The new cyclic friction replacement part allows for the minimum friction to be set in exactly the same manner as the original configuration. The additional cyclic friction, applied at the pilot's discretion, is provided by a cam action lever. The cam action provides the mechanical advantage needed to close the gap in the clamp around the cyclic stick pivot ball. Experience with the cam lever arrangement in similar applications shows wear on the mating surfaces is not a significant issue, which will extend the service life of the new part over the original.

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

No additional airworthiness limitations have been imposed due the installation of the Cyclic Friction Replacement.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Inspections are to be carried out in accordance with the schedule and procedures in the existing Maintenance Manual as applicable to the model of helicopter, or other approved program.

Refer to Maintenance Manual, Chapter 5, as follows:

206B: BHT-206A/B-MM-1

206L: BHT-206L-MM-1

206L-1: BHT-206L1-MM-1

206L-3: BHT-206L3-MM-1

206L-4: BHT-206L3-MM-1

407: BHT-407-MM-1

CHAPTER 67 – FLIGHT CONTROLS**67-1 CYCLIC FRICTION REMOVAL**

Removal instructions are applicable if the cyclic friction is removed by itself or as part of removing the entire cyclic stick assembly. Refer to Maintenance Manual Chapter 27 (Bell 206L and 260L-1) or Chapter 67 (Bell 206B, 206L-3, 206L-4, 407) for removal instructions of the cyclic stick assembly.

Refer to figure 67.1

1. Remove pilot seat. Refer to Maintenance Manual Chapter 25.
2. Remove pilot seat panel.
3. Place cyclic friction lever in OPEN position (straight out).
4. Remove cotter pin (7), nut (6), washers (04/05), and curved washer (03) from end of cyclic friction.
5. Slide cyclic friction assembly out of cyclic pivot support assembly and out of cyclic stick boot.

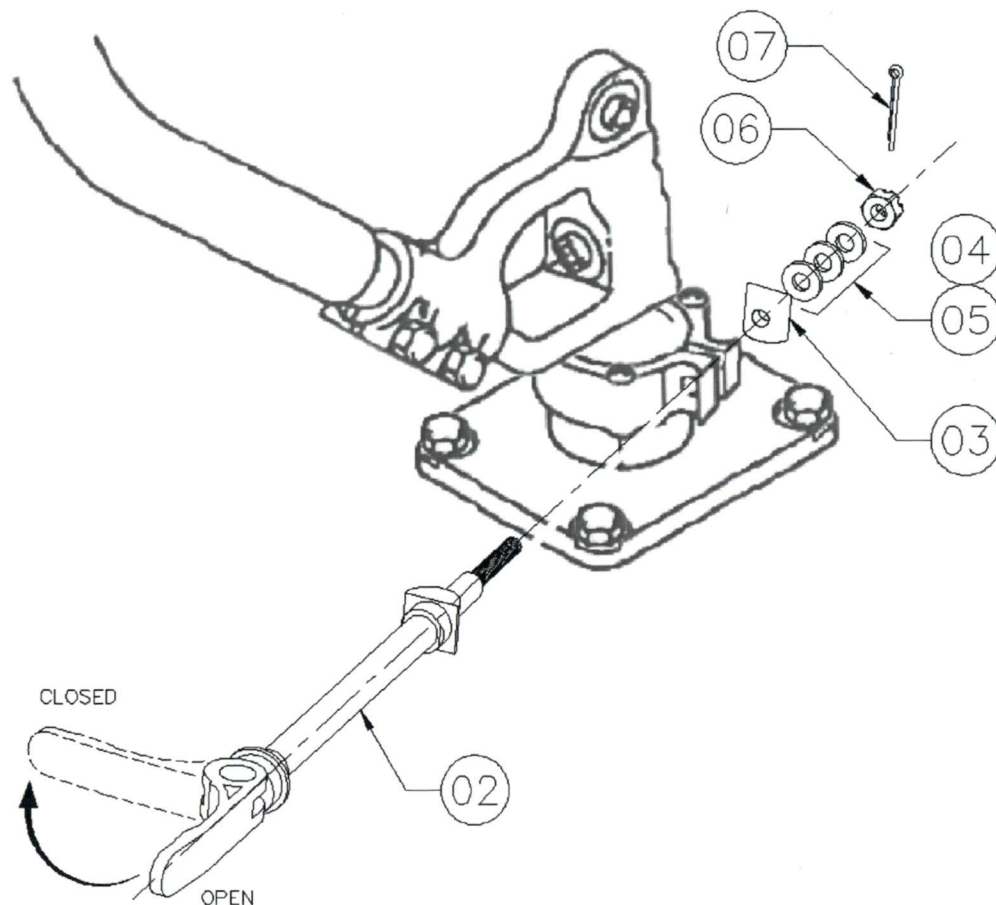


Figure 67.1 – Cyclic Friction Assembly

67-2 CYCLIC FRICTION INSTALLATION

Refer to figure 67.1

1. Remove pilot seat. Refer to Maintenance Manual Chapter 25.
2. Remove pilot seat panel.
3. Slide cyclic friction assembly (02) into cyclic stick boot, seat curved end into cyclic pivot support assembly.
4. Slide curved washer (03) onto threaded end of cyclic friction assembly.
5. Slide NAS1149F0363 (04) and/or NAS1149F0332 (05) washers (as required) onto threaded end of cyclic friction assembly.
6. Thread AN310-3 castellated nut (06) onto threaded end of cyclic friction assembly. Do not tighten.
7. Set minimum friction in accordance with Section 67-3 (below).
8. Safety the AN310-3 castellated nut with MS24665-153 cotter pin (07) in accordance with AC43.13-1B, section 7-127, in the minimum friction position.
9. Install pilot seat panel and pilot seat. Refer to Maintenance Manual Chapter 25.

67-3 CYCLIC FRICTION ADJUSTMENT - MINIMUM FRICTION

1. Set minimum friction with cam lever in OPEN position (straight out) and loose in accordance with the maintenance manual:

206B: BHT-206A/B-MM-8, Section 67-39

206L: BHT-206L-MM-1, Section 27-27A

206L-1: BHT-206L1-MM-1, Section 27-28

206L-3: BHT-206L3-MM-8, Section 67-40

206L-4: BHT-206L3-MM-8, Section 67-40

407: BHT-407-MM-8, Section 67-56

67-4 OPERATING INFORMATION

The pilot may increase friction beyond the minimum as set by rotating the cam lever to the closed position.

To adjust the amount of friction provided by the cam action above the minimum friction:

1. Set cam lever to OPEN position (straight out).
2. Turn lever clockwise to increase friction, counter-clockwise to reduce friction
3. Rotate cam lever to CLOSED position (perpendicular to shaft) to check friction.

CAUTION

Avoid setting the cam lever where the CLOSED position points between the 9 o'clock and 12 o'clock position when looking aft, see figure 67.2.

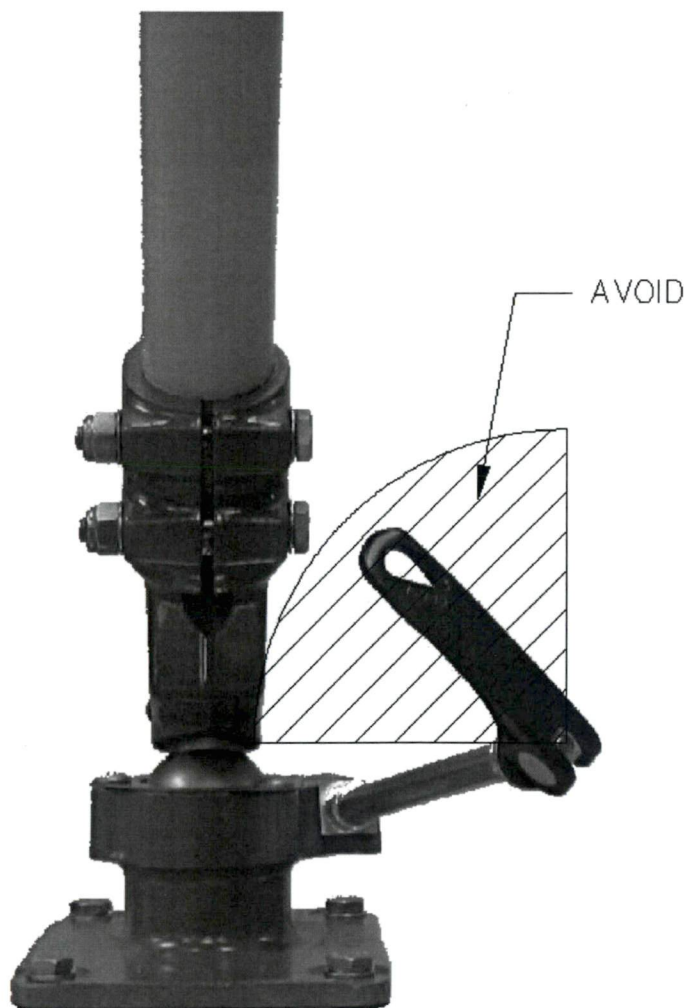


Figure 67.2 – Cam Lever Avoid Region
(Looking aft)

SENDER ACCOUNT NO. N° DE COMPTE DE L'EXPÉDITEUR 4367155		IMPORTANT - TÉLÉPHONE (403) 250 8027	
SENDER (FROM) / EXPÉDITEUR (DE) AERO DESIGN		MO DY/JR YR/AN 12/13/12	
STREET ADDRESS / ADRESSE (N° ET RUE) 2013 39 AVE NE			
CITY / VILLE CALGARY		PROV./STATE/ÉTAT AB	POSTAL / ZIP T2E 6R7
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ATTN: (NAME / DEPT.) / À L'ATTENTION DE (NOM / SERVICE) JACK STAAL		IMPORTANT - TÉLÉPHONE (780) 495 5227	
DESCRIPTION (INCLUDING DANGEROUS GOODS / INCLUANT MARCHANDISES DANGEREUSES) DOCUMENTS			
SENDER REFERENCE (IF ANY) / REF. DE L'EXPÉD.		PICK UP / CUEILLETTE - N° DE CONF. 0002	

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SEE CONDITIONS OF CARRIAGE ON REVERSE / CONDITIONS DE TRANSPORT AU VERSO

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SHIP MODE / MODE DE TRANSPORT

AIR AÉRIEN	<input type="checkbox"/>	GROUND ROUTIER	<input checked="" type="checkbox"/>
PKG / EMBAL.		SERVICE	
PUR-LETTER	<input type="checkbox"/>	9 AM	<input type="checkbox"/>
PUR-PAK	<input checked="" type="checkbox"/>	10:30 AM	<input type="checkbox"/>
OTHER AUTRE	<input type="checkbox"/>	SAT. SAM.	<input type="checkbox"/>

PAYMENT / PAIEMENT

CASH COMPTANT	<input type="checkbox"/>	CREDIT CARD CARTE DE CRÉDIT	<input type="checkbox"/>
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RECEIVER OR THIRD PARTY ACCOUNT NO. / N° DE COMPTE DU DESTINATAIRE OU TIERS

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SENDER
EXPÉDITEUR

SHIPMENT / DÉTAILS / EXPÉDITION

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1	KG	LB
		1

DECLARED VALUE / VALEUR DÉCLARÉE
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(SUPPLÉMENT AU-DESSUS DE 100 \$)\$ **NIL** \$5,000 MAX.
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-NON NÉGOCIABLE

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NO./N° TYPE <input type="checkbox"/> VISA <input type="checkbox"/> MC <input type="checkbox"/> AMEX		EXP. DATE D'EXP.

CHARGES

FRAIS

TOTAL AMOUNT / MONTANT TOTAL

THIRD PARTY BILLING NAME & ADDRESS / FACTURATION À UN TIERS (NOM & ADRESSE)

LIMITATION OF LIABILITY - IMPORTANT - PLEASE READ
THE AMOUNT OF ANY LOSS OR DAMAGE FOR WHICH THE CARRIER MAY BE LIABLE SHALL NOT EXCEED \$2.00 PER POUND (OR \$4.41 PER KILOGRAM) COMPUTED ON THE TOTAL WEIGHT OF THE SHIPMENT UNLESS A HIGHER VALUE IS DECLARED ON THE FACE OF THE BILL OF LADING BY THE CONSIGNOR (SENDER). MAXIMUM DECLARED VALUE SHALL NOT EXCEED \$5,000. A.B. NOTE CAREFULLY CONDITIONS ON BACK HEREOF INCLUDING LIMITATIONS AND EXCLUSIONS OF CARRIER'S LIABILITY, WHICH ARE HEREBY ACCEPTED.

LIMITATION DE RESPONSABILITÉ - IMPORTANT - LISEZ S.V.P.
LE MONTANT DE TOUTE Perte OU DOMMAGE DONT LE TRANSPORTEUR POURRAIT ÊTRE RESPONSABLE NE DOIT PAS EXCÉDER 2,00 \$ LA LIVRE (OU 4,41 \$ LE KILOGRAMME), CALCULÉ SUR LE POIDS TOTAL DE L'EXPÉDITION, À MOINS QU'UNE VALEUR SUPÉRIEURE N'AIT ÉTÉ DÉCLARÉE SUR LE RECTO DU CONNAISSANCE PAR L'EXPÉDITEUR. LA VALEUR DÉCLARÉE MAXIMALE NE DÉPASSERA PAS 5 000 \$ A.B. VEUILLEZ PRENDRE CONNAISSANCE DES CONDITIONS AU VERSO, Y COMPRIS LES LIMITATIONS ET EXCLUSIONS DE RESPONSABILITÉ DU TRANSPORTEUR, QUI SONT ACCEPTÉES PAR LES PRÉSENTES.

PLEASE REFER TO BILL OF LADING NUMBER FOR SHIPMENT STATUS / INQUIRIES.
POUR TOUT RENSEIGNEMENT, VEUILLEZ NOUS COMMUNIQUER LE NUMÉRO DE CONNAISSANCE.

Aero Design Ltd.



SERVICE INSTRUCTIONS

SI 952.99

BELL 206B / 206L / 407

CYCLIC FRICTION REPLACEMENT

Barrel nut upgrade

Prepared by: Jeff Clarke, CET

Revision 0, 11 October 2013

Aero Design Ltd.

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1.0 INTRODUCTION

This service instruction provides instructions necessary for the replacement of the existing nylon barrel nut with a brass barrel nut used in the cam lever of the replacement cyclic friction.

2.0 REFERENCE TEXT

Installation drawing 95201, Revision 0

Instructions for Continued Airworthiness ICA 952.90, Revision 0

3.0 PARTS REQUIRED

Qty	Part Number	Description
1	95210-01	Cyclic Friction Assembly
1	95230-01-R1	Barrel Nut (Brass)

4.0 INSTALLATION INSTRUCTIONS

The following instructions may be performed with the cyclic friction installed on the helicopter in accordance with drawing 95201, or not installed as stock.

1. Remove cam lever handle from 95210-01 cyclic friction assembly by rotating handle counter clockwise.
2. Remove 95230-01 nylon barrel nut from cam lever handle.
3. Insert brass barrel nut 95230-01-R1 into cam lever handle.
4. Orient barrel nut so that thread insert will engage on threaded rod of cyclic friction, see figure 4.1 and 4.2.



Figure 4.1 – Barrel Nut Orientation
(note threads come to edge of barrel nut)



Figure 4.2 – Barrel Nut Orientation
(note flange before threads)

Caution: Do not insert threaded rod through unthreaded side (side with a flange before the thread insert). This may drive the thread insert out of the barrel nut.

5. Thread cam lever handle onto cyclic friction. If cyclic friction is installed on a helicopter, continue threading until desired friction is applied when lever is rotated closed, see figure 4.3. Refer to ICA952.90 and FMS952.91 for further information.

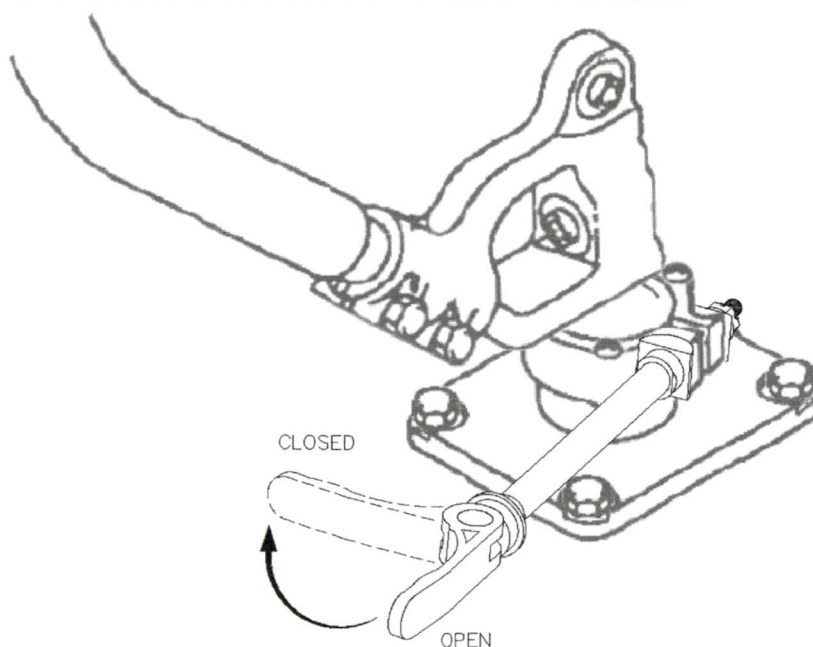


Figure 4.3 – Cam Lever Operation

407

~~Base~~ Assy

Pivot Support Assy, Cyclic Friction

206-001-397-105 → 407

206-001-397-001

101

206B/206L

Pivot Support, cyclic friction (Base part)

206-001-397-103 - 407

not listed in 206B/L

Max? ✓

~~MIS~~ Remanp EASA
- documentation + SK

AERO DESIGN LTD.

2013 - 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

www.aerodesign.ca

13 December 2012

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File :

Our File : 952

Re: Bell Light Helicopter Cyclic Friction - FAA Application

Jack,

Please find attached the following documents in support of application for an FAA STC:

Modification Approval Request Application Form	MOD952_FAA	Rev. 0
FAA STC Application form 8110-12		
Transport Canada STC	SH12-59	Issue 1
Compliance Program	CP952	Rev. 1
Document Control List	DCL952-1	Rev. 0
Document Control List	DCL952-11	Rev. 0
Flight Manual Supplement	FMS952.91	Rev. 0
Instructions for Continued Airworthiness	ICA952.90	Rev. 0
Engineering Report	ER952.01	Rev. 1
Drawings		
Cyclic Friction Installation	95201	Rev. 0
Friction Assembly	95210	Rev. 0
Threaded Rod Assembly	95212	Rev. 0
Parts - Tube	95220	Rev. 0
Parts - Retainer Bushing	95222	Rev. 0
Parts - Cap	95224	Rev. 0
Parts - Crescent Bushing	95226	Rev. 0
Parts - Curved Washer	95228	Rev. 0
Parts - Barrel Nut	95230	Rev. 0
Parts - Threaded Rod	95232	Rev. 0
Parts - Stop	95234	Rev. 0
Parts - Stop	95236	Rev. 0
Parts - Curved Washer	95238	Rev. 0

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

www.aerodesign.ca

Three copies of the above files are included on CDs for submission to the FAA.

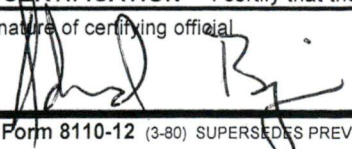
Regards,

A handwritten signature in black ink, appearing to read 'E. Burgoin'.

For: E. Burgoin, P.Eng, DAR 290M

Encl.

No certificate may be issued unless a completed application form has been received (14 C.F.R. 21)

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION		FORM APPROVED O.M.B. No. 04-R0078
APPLICATION FOR TYPE CERTIFICATE, PRODUCTION CERTIFICATE, OR SUPPLEMENTAL TYPE CERTIFICATE		
1. Name and address of applicant AERO Design Ltd. 2013 39 th Avenue NE Calgary, Alberta, Canada T2E 6R7	2. Application made for - <input type="checkbox"/> Type Certificate <input type="checkbox"/> Production Certificate <input checked="" type="checkbox"/> Supplemental Type Certificate	3. Product involved <input checked="" type="checkbox"/> Aircraft <input type="checkbox"/> Engine <input type="checkbox"/> Propeller
4. TYPE CERTIFICATE (Complete item 4a below)		
a. Model designation(s) (All models listed are to be completely described in the required technical data, including drawings representing the design, material, specifications, construction, and performance of the aircraft, aircraft engine, propeller which is the subject of this application.)		
5. PRODUCTION CERTIFICATE (Complete items 5a-c below. Submit with this form, in manual form, one copy of quality control data or changes thereto covering new products, as required by applicable FAR.)		
a. Factory address (If different from 1 above)	b. Application is for - <input type="checkbox"/> New Production Certificate <input type="checkbox"/> Additions to Production Certificate (Give P.C. No.)	P.C. No.
c. Applicant is holder of or a licensee under a Type Certificate or a Supplemental Type Certificate (Attach evidence of licensing agreement and give certificate number) _____		T.C./S.T.C. No.
6. SUPPLEMENTAL TYPE CERTIFICATE (Complete items 6a-d below)		
a. Make and model designation of product to be modified Bell 206B, 206L, 206L-1, 206L-3, 206L-4, 407 (TCDS H2SW, Canadian TCDS H-92)		
b. Description of modification Installation of replacement cyclic stick friction assembly. The original installation uses two barrel nuts and a threaded shaft with different thread pitches to apply friction to the pivot ball of the pilot cyclic. Minimum friction is applied with a stack-up of washers secured with a castle nut and cotter pin by the AME on installation. A round knob is provided adjacent to the cyclic stick for the pilot to apply additional friction as required. It is very common to strip the threads out of the barrel nuts and/or the shaft, in some cases multiple times in one season. This installation removes these common wear items and replaces them with a shaft that uses a cam-lever to apply the additional friction desired by the pilot. Minimum friction is set the same way by the AME on installation.		
c. Will data be available for sale or release to other persons? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	d. Will parts be manufactured for sale? (Ref. FAR 21.303) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
7. CERTIFICATION - I certify that the above statements are true.		
Signature of certifying official 	Title DAR 290M	Date 12 December 2012

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD952_FAA, Rev. 0

1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7	2. ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7
--	--

3. IDENTIFICATION OF PRODUCT: MAKE: Bell	MODEL: 206B, 206L, 206L-1, 206L-3, 206L-4, 407	SERIAL No.: All eligible	REGISTRATION: All eligible
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4. REQUEST FOR:

A. <input type="checkbox"/> SUPPLEMENTAL TYPE CERTIFICATE (STC)	B. <input type="checkbox"/> STC REVISION	STC No. _____	Issue
C. <input type="checkbox"/> LIMITED STC (LSTC)	D. <input type="checkbox"/> LSTC REVISION	LSTC No. _____	Issue
E. <input type="checkbox"/> REPAIR DESIGN CERTIFICATE (RDC)	F. <input type="checkbox"/> RDC REVISION	RDC No. _____	Issue
G. <input checked="" type="checkbox"/> F.A.A. SUPPLEMENTAL TYPE CERTIFICATE	H. <input type="checkbox"/> FAA STC REVISION	STC No. _____	Issue
I. <input type="checkbox"/> FAMILIARIZATION OF A FOREIGN TYPE DESIGN CHANGE			

FAA STC # _____ EASA STC # _____ OTHER STC # _____

5. TITLE OF MODIFICATION OR REPAIR:
 Cyclic Friction Replacement

6. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR:
 Installation of cyclic friction assembly as a direct replacement for the original knob/shaft/barrel nut arrangement.

7. APPLICABLE TYPE CERTIFICATE (TC) DOCUMENTS:

A. Cdn. TC NO. H-92	B. Foreign TC No. H2SW	C. OTHER (Please specify)
---------------------	------------------------	---------------------------

8. PROPOSED BASIS OF APPROVAL:

A. SAME AS Cdn. TC <input checked="" type="checkbox"/>	B. SAME AS Foreign TC <input type="checkbox"/>	C. OTHER <input type="checkbox"/> (Please specify)
--	--	--

9. DOCUMENTATION CHECKLIST	REQUIRED		(FOR DOT USE ONLY) RECEIVED		
	YES	NO	YES	NO	DATE
COMPLIANCE PROGRAM	X				
MASTER DRAWING LIST	X				
ENGINEERING REPORTS	X				
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS	X				
WEIGHT AND MOMENT CHANGE	X				
FLIGHT MANUAL SUPPLEMENT	X				
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS	X				
AIRWORTHINESS LIMITATIONS		X			
MAINTENANCE MANUAL SUPPLEMENT		X			
ELECTRICAL LOAD ANALYSIS		X			
FLIGHT TEST DATA		X			
DESIGN DRAWINGS		X			
DRAFT STC, LSTC OR RDA		X			
OTHER (Specify):					

10. APPLICANT'S REMARKS:
 Based on TCCA STC SH12-59.

11. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.

PER: SIGNATURE OF APPLICANT	Consultant _____ TITLE _____	12 December 2012 DATE _____
12. SIGNATURE REGIONAL AIRWORTHINESS ENGINEER _____ TITLE _____ DATE _____		



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Your file Votre référence

Our file Notre référence

C-12-0917
5010-0402

28 November 2012

AERO Design Limited
2013 - 39 Ave. NE
Calgary, AB
T2E 6R7

ATTENTION: EDWARD BURGOIN – DAR 290M

Dear Sirs:

SUBJECT: Extension of DAR 290M Authority – Bell Light Helicopter Cyclic Friction Replacement, Approval Number SH12-59 – Issue 1

This letter is in response to your requests for extension of delegation dated 1 November 2012, to cover FAR 27.777 and 27 November 2012, to cover FAR 27.679(a) and (b), concerning the subject design change. You are hereby authorized to make findings of compliance for the following paragraphs as listed in Compliance Plan CP952, Revision 1, dated 27 November 2012, which is attached:

FAR 27.679(a)	Control System Locks – warning engaged
FAR 27.679(b)	Control System Locks – in-flight
FAR 27.777	Cockpit Controls

This is a one-time extension and is to be exercised for this approval only. Approval Number SH12-59 – Issue 1 has been assigned for your use.

If you have any questions or wish to discuss this project further, please contact the project OPI, Jack Staal at Telephone 780-495-5227 of the Edmonton TCC.

Yours truly,

F.J.B. Wright
Technical Team Lead, Engineering
Civil Aviation
Prairie and Northern Region
Phone: 780-495-3856
Facs: 780-495-7963

Canada

Jeff Clarke

From: Jeff Clarke [jeff@aerodesign.ca]

Sent: November 28, 2012 2:06 PM

To: 'Staal, Jack'

Subject: C-12-0917 - Bell Cyclic Friction

Jack,

I have uploaded the signed copies of the documentation for this project to NAPA. Please find attached the draft STC, DCLs, and FMS with STC # to be stamped/signed.

Regards,

Jeff Clarke, CET

AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, Canada
T2E 6R7

Phone: 403.250.8027

Fax: 403.250.8333

28/11/2012

Department of Transport

Supplemental Type Certificate

This approval is issued to:

AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta
Canada T2E 6R7

Number: SH12-59

Issue No.: 1

Approval Date:

Issue Date:

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

Bell 206B, 206L, 206L-1, 206L-3, 206L-4, 407

Registration/Serial No.:

All eligible

Canadian Type Certificate or Equivalent:

H-92

Description of Type Design Change:

Installation of Cyclic Stick Control Friction as a Direct Replacement for Bell Cyclic Knob and Shaft Assembly.

Installation/Operating Data, Required Equipment and Limitations:

Installation of the Cyclic Stick Control Friction to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL952-1, Revision 0, dated 28 November 2012, or later approved revision.

Transport Canada approved, AERO Design Ltd. Flight Manual Supplement FMS952.91, Revision 0, dated 26 October 2012, or later approved revision is required with this installation.

Transport Canada accepted, AERO Design Ltd. Instructions for Continued Airworthiness ICA952.90, Revision 0, dated 25 October 2012, or later accepted revision is required with this installation.

Basis of certification remains as defined in the applicable Type Certificate Data Sheets.

— End —

DRAFT

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

For Minister of Transport

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS 95201 FMS952.91 ICA952.90 FABRICATION DOCUMENTS DCL952-11	Installation Drawing	0
	Flight Manual Supplement	0
	Instructions for Continued Airworthiness	0
	Document Control List	0
APPROVAL:	ORIGINAL DATE: 28 November 2012 REVISION DATE:	AERO DESIGN LTD. 2013 – 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 www.aerodesign.ca
	SHEET 1 OF 1	Bell 206B, 206L Series, 407 Cyclic Friction Replacement Installation
	DCL952-1	Rev. 0

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
95210	Friction Assembly	0
95212	Threaded Rod Assembly	0
95220	Parts – Tube	0
95222	Parts – Retainer Bushing	0
95224	Parts – Cap	0
95226	Parts – Crescent Bushing	0
95228	Parts – Curved Washer	0
95230	Parts – Barrel Nut	0
95232	Parts – Threaded Rod	0
95234	Parts – Stop	0
95236	Parts – Stop	0
95238	Parts – Curved Washer	0
ENGINEERING DOCUMENTS		
ER952.01	Engineering Report	1
APPROVAL:	ORIGINAL DATE: 28 November 2012 REVISION DATE:	AERO DESIGN LTD. 2013 – 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 www.aerodesign.ca
	SHEET 1 OF 1	Bell 206B, 206L Series, 407 Cyclic Friction Replacement Fabrication
	DCL952-11	Rev. 0



Transport
Canada

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Canada

**MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE
WITH THE CERTIFICATION BASIS**

**DÉLÉGUÉ MINISTÉRIEL CONSTAT DE CONFORMITÉ
AVEC LA BASE DE CERTIFICATION**

1. Reference No. / N° de référence NAPA File C-12-0917 Aero Design Project 952		2. Applicant Name / Nom de demandeur Aero Design Ltd.	
Part 1: Identification of Aeronautical Product Partie 1 : Identification des produits aéronautiques			
3. Applicable Design Approval Document No. / N° du document d'approbation de la conception applicable TCDS H-92			
4. Model No. / N° de modèle 206B, 206L, 206L-1, 206L-3, 206L-4, 407		5. Make / Marque Bell	
6. Type (aircraft, engine, propeller, appliance, part) / Type (aéronef, moteur hélice, appareillage, pièce) Aircraft			
Part 2: Substantiating Reports and Data Partie 2 : Rapports et des données pertinentes			
7. Number / Numéro DCL952-1 Revision 0		8. Title / Titre Document Control List, and all documents referenced therein.	
DCL952-11 Revision 0		Document Control List, and all documents referenced therein.	
9. Purpose of Finding of Compliance / But de la constat de conformité <input checked="" type="checkbox"/> New approval: <input checked="" type="checkbox"/> Supplemental Type Certificate <input type="checkbox"/> Supplemental Type Certificate-Limited <input type="checkbox"/> Repair Design Certificate <input type="checkbox"/> Other: Installation of replacement cyclic friction. <input type="checkbox"/> Revise existing approval # The revised data requires the revision of the approval document. The revised data is within the scope of the accepted Certification Plan.			
10. Applicable Elements of Certification Basis / Éléments applicables de la base de certification <input checked="" type="checkbox"/> Certification Plan: CP952, Rev. 1 <input checked="" type="checkbox"/> Letter of exention of delegation, dated: 28 November 2012			
Part 3: Ministerial Delegate Finding of Compliance with the Certification Basis Partie 3 : Délégué ministériel constat de conformité avec la base de certification			
Under the authority vested in me by the Minister under subsection 4.3(1) of the <i>Aeronautics Act</i> , I hereby find that the type design of the aeronautical product is in compliance with the certification basis as demonstrated by the applicant's substantiating reports and data to the best of my knowledge.		En vertu des pouvoirs qui m'ont été conférés par le ministre conformément au paragraphe 4.3(1) de la <i>Loi sur l'Aéronautique</i> , j'estime que, à ma connaissance, la définition de type du produit aéronautique est conforme à sa base de certification tel qu'il a été démontré par les rapports et les données pertinentes fournis par le demandeur.	
11. Signature of Delegate(s) Signature des délégués	12. Name / Nom	13. Delegate No. / N° de délégué	14. Date (yyyy-mm-dd) Date (aaaa-mm-jj)
	E. Burgoin, Aero Design Ltd.	DAR 290M	28 November 2012


**MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE
WITH THE CERTIFICATION BASIS**
**DÉLÉGUÉ MINISTÉRIEL CONSTAT DE CONFORMITÉ
AVEC LA BASE DE CERTIFICATION**

Block 7 (continued from sheet 1)

Document Number	Revision	Title	Comment
-----------------	----------	-------	---------

ER952.01	1	Engineering Report	
95201	0	Installation Drawing	
95210	0	Friction Assembly	
95212	0	Threaded Rod Assembly	
95220	0	Parts – Tube	
95222	0	Parts – Retainer Bushing	
95224	0	Parts – Cap	
95226	0	Parts – Crescent Bushing	
95228	0	Parts – Curved Washer	
95230	0	Parts – Barrel Nut	
95232	0	Parts – Threaded Rod	
95234	0	Parts – Stop	
95236	0	Parts – Stop	
95238	0	Parts – Curved Washer	

Documents listed below this line (if any) cannot be approved by the delegate:

ICA952.90	0	Instructions for Continued Airworthiness	
FMS952.91	0	Flight Manual Supplement	

APPLICANT: AERO Design Ltd.
2013 - 39th Ave N.E.
Calgary, Alberta, T2E 6R7

ORIGINAL DATE: 27 November 2012
REVISION No. 1

CP952

CORRESPONDANCE TO: AERO Design Ltd.
(If other than applicant) 2013 - 39th Ave N.E.
Calgary, Alberta, T2E 6R7

MAKE: Bell
MODEL: 206B, 206L Series, 407

REGISTRATION: All eligible
SERIAL No.: All eligible

NATURE OF WORK: Cyclic Stick Control Friction

TYPE CERTIFICATE DATA SHEET: H-92

MODEL CERTIFICATION BASIS: FAR Part 27, dated 2 October 1964, including amendments 27-1 through 27-30 except as noted (Bell 407)


MODIFICATION CERTIFICATION BASIS: FAR Part 27, dated 2 October 1964, including amendments 27-1 through 27-30 except as noted (Bell 407)

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart B - Flight					
27.29	Empty weight and corresponding C of G	N/A			No change from Type Approved configuration
Subpart D - Design and Construction					
27.601	Design	Use of conventional design	X		
27.603	Materials		X		
27.605(a)	Fabrication Methods		X		
27.607(b)	Fasteners		X		
27.609	Protection of Structure		X		
27.611	Inspection Provisions	No change from Type Approved configuration	X		
27.679(a)	Control system locks – warning engaged	Statement in report			** No change from Type Approved configuration
27.679(b)	Control system locks – in flight	Cockpit evaluation			**
27.777	Cockpit Controls	Statement in Report			**
Subpart G - Operating Limitations and Information					
27.1529	Instructions for Continued Airworthiness	ICA provided	X		
27.1581	Rotorcraft Flight Manual - General	FMS provided	X		
27.1585	Operating Procedures	FMS provided	X		Instructions provided in the existing Flight Manual are applicable without change. Additional instructions on use of friction are provided.

DECLARATION OF CONFORMITY WITH THE CERTIFICATION BASIS

In accordance with Canadian Aviation Regulations Subpart 521, I hereby declare that the design of the Cyclic Friction Replacement, as detailed in the data approved by Transport Canada approval SH12-59, has been demonstrated to conform to the best of my knowledge to the basis of certification established by the Minister for that approval in file C-12-0917.

AERO Design Ltd.

per: 

Signature

E. Burgoin

Print Name

Consultant

Title

28 November 2012

Date

Transport
CanadaTransports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Your file Votre référence

Our file Notre référence

C-12-0917
5010-0402

28 November 2012

AERO Design Limited
2013 - 39 Ave. NE
Calgary, AB
T2E 6R7

ATTENTION: EDWARD BURGOIN - DAR 290M

Dear Sirs:

SUBJECT: Extension of DAR 290M Authority - Bell Light Helicopter Cyclic Friction Replacement, Approval Number SH12-59 - Issue 1

This letter is in response to your requests for extension of delegation dated 1 November 2012, to cover FAR 27.777 and 27 November 2012, to cover FAR 27.679(a) and (b), concerning the subject design change. You are hereby authorized to make findings of compliance for the following paragraphs as listed in Compliance Plan CP952, Revision 1, dated 27 November 2012, which is attached:

FAR 27.679(a)	Control System Locks - warning engaged
FAR 27.679(b)	Control System Locks - in-flight
FAR 27.777	Cockpit Controls

This is a one-time extension and is to be exercised for this approval only. Approval Number SH12-59 - Issue 1 has been assigned for your use.

If you have any questions or wish to discuss this project further, please contact the project OPI, Jack Staal at Telephone 780-495-5227 of the Edmonton TCC.

Yours truly,

F.J.B. Wright
Technical Team Lead, Engineering
Civil Aviation
Prairie and Northern Region
Phone: 780-495-3856
Facs: 780-495-7963

Canada

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

www.aerodesign.ca

27 November 2012

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File : C-12-0917

Our File : 952

Re: Bell Light Helicopter Cyclic Friction Replacment

Jack,

Further to our request for extention of delegation dated 01 November 2012 for paragraph FAR 27.777 cockpit controls, the input and discussion with Michel Brulotte has added FAR 27.679(a) and (b) to the compliance program.

Please extend my delegation to include the following paragraphs as indicated in Compliance Program CP952 at Revision 1, dated 27 November 2012, which is attached:

FAR 27.679(a) - Control System Locks - warning engaged
FAR 27.679(b) - Control System Locks - in flight

Regards,

E. Burgoin, P.Eng, DAR 290M

Encl.

AERO Design Ltd.

ENGINEERING REPORT

ER952.01

BELL HELICOPTER

MODELS 206B, 206L, 206L-1, 206L-3, 206L-4 AND 407

REPLACEMENT CYCLIC STICK FRICTION

Approved by: E. Burgoin, DAR 290M

Revision 1, 27 November 2012

AERO Design Ltd.
Engineering Consultants
www.aerodesign.ca

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333

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Revision 1
27 November 2012

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1.0 INTRODUCTION

The cyclic stick control on light Bell helicopters has an adjustable friction device built into the base of the cyclic stick pivot. Two adjustments can be made: a) minimum friction, which is set by the AME, and b) additional friction which can be set by the pilot to suit his preference.

The minimum friction is applied and adjusted by tightening a castellated nut on the end of the cyclic friction shaft in accordance with instructions found in the Bell Maintenance Manual and secured with a cotter pin. This adjustment is made by removing the pilot's seat and seat panel and is not accessible except when opened up for maintenance activities.

The additional friction applied at the pilot's discretion, is provided by rotating the cyclic friction shaft high projects out from under the pilot's seat. The shaft has two (2) sections of thread: one section is a 5/16-24 UNF thread and the other section is a 1/4-20 UNC thread. Each section of threaded shaft is fitted onto its own barrel nut which spans a gap in the clamp which tightens Cyclic Stick Pivot ball. As the shaft is rotated, the distance between the barrel nuts increases/decreases due to the differential between the two thread pitches causing a clamping action with considerable mechanical advantage. A knob (approx. 1.5 in. dia.) is fitted to end of the shaft protruding forward from under the pilot's seat allowing the pilot to make adjustments while seated.

The Bell Flight Manuals do not provide any guidance as to what the additional friction provided by the pilot is suppose to do or how to operate the control except to say: "Tighten friction as desired". In practice, the cyclic friction is tightened up to hold the cyclic control when the pilot exits the helicopter while the main rotor is still turning. This may be when the rotor is spooling down after the engine has been shut down or in some cases with the engine running (pilot only hot refueling)

When required, to ensure that there is no movement of the stick, pilot's torque up the cyclic stick friction as hard as they can with the size of the knob provided. The result is severe wear on the shaft threads and associated barrel nuts. It is common to replace these components every season and in the extreme they may be replaced several times during a season.

A new cyclic friction device has been designed to eliminate the wear issues found in the Bell parts and the resulting costly annual maintenance.

The minimum cyclic friction is set by the AME in a manner which is exactly identical to the existing Bell components: a castellated nut and cotter pin onto the end of the shaft. All of the instructions in the Bell maintenance manual related to setting minimum friction are applicable.

The additional cyclic friction, applied at the pilot's discretion, is provided by a cam action similar to that used on a quick-release bicycle hub. The cam action provides the mechanical advantage needed to close the gap in the clamp around the Cyclic Stick Pivot ball. Cam-action quick-release bicycle hubs have been used on racing bikes for over sixty years. Experience has demonstrated them to be reliable and not subject to excessive wear.

2.0 REFERENCE TEXT

Aero Design Ltd. Installation drawing 95201 and subsequent
Bell 206B Maintenance Manual
Bell 206B Flight Manual
Bell 206L, L1, L3 and L4 Maintenance Manuals
Bell 206L, L1, L3 and L4 Flight Manuals
Bell 407 Maintenance Manual
Bell 407 Flight Manual

3.0 BASIS OF CERTIFICATION

206, 206A, 206A-1, 206B, 206B-1, 206L and 206L-1

CAR 6 dated December 20, 1956, Amendments 6-1 thru 6-4, CAR 6.307(b) and 6.637 of Amendment 6-5, Special Conditions dated October 2, 1962, as revised February 8, 1966, plus the water/alcohol power augmentation special conditions dated November 14, 1967, revised September 15, 1975. Special Conditions for "IFR Instrument Flight requirements for Bell Model 206B/L" submitted to Bell by FAA (ASW-216) letter dated July 16, 1975.

Exemption No. 595 for Model 206A only.

Exemption No. 595A for Model 206A-1 only.

Exemption. 595B for Model 206B and 206B-1 only.

206L-3

For 206L-3 the basis of certification is the same as above plus FAR 27.1529 at amendment 18.

206B S/N 5101 through 5400

The Basis of Certification is same as 206B above plus:

Model 206B S/N 5101 through 5400, meets fuel system qualifications to NPRM 90-24. "Crash resistant fuel systems in normal and transport category rotorcraft", Draft paragraph 29-952 and associated revised paragraphs refer.

206L-4

For Model 206L-4 FAR Part 27 dated 2 October 1964 Amendment 27-1 thru 27-24 with: 27.45, 27.141, 27.1309 at Amdt 27-20; 27.1093, 27.1545 at Amdt 27-8; 27.79, 27.143, 27.173, 27.175, 27.1519, 27.1585, 27.1587 at Amdt 27-1; 27.2, 27.307, 27.337, 27.351, 27.427, 27.501, 27.571, 27.613, 27.629, 27.663, 27.674, 27.685, 27.727, 27.783, 27.807, 27.861, 27.865 at Amdt 27-28; and 27.391, 27.395, 27.397, 27.681, 27.1357, 27.1361, replaced by 6.220, 6.225, 6.323, 6.623, 6.624, 6.625, 6.626 of CAR Part 6 dated 6 December 1956

Amendment 6-1 thru 6-4.

Exceptions to FAR 27 are the deletion of: 27.71, 27.177, 27.399, 27.562, 27.610, 27.954, 27.1195, 27.1322.

Equivalent Safety Findings: 1. Skid Landing Gear (Drop Test) - FAR 27.723, 27.725, and 27.727; 2. Fuel Tanks (Drop Test) - FAR 27.965(c)(1) and (c)(2). FAR Part 36 dated 3 November 1969 Amendment 36-1 thru 36-14, Subpart H

407

- 1) FAR part 27, dated October 2, 1964 Amendment 27-1 through 27-30
Paragraph 27.561(b)(3) at Amdt 27-24;
Section 27.563 at Amdt. 27-25;
Section 27.785 at Amdt 27-24;
Section 27.1093 at amendment 27-8; and
Section 27.173 at amendment 27-1.
Section 27.175 at amendment 27-1
Exemptions to FAR 27 are the deletion of sections: 27.562, 27.1195, and 27.952(b)(1)
- 2) FAR 36 Amdt. 36-1 through 36-20, and Chapter 516 of Transport Canada Airworthiness Manual which is the same as ICAO Annex 16 (Chapter II, dated March 1993).
- 3) Plus the following sections of Canadian Airworthiness Manual, Change 527-3 dated January 3, 1994;

527.1093(b)(i)(ii), & (iii)	Induction System Icing Protection
527.1301-1	Rotorcraft Operations After Ground Cold Soak
527.1557(c)(3)	Miscellaneous Markings and Placards
527.1581(e)	Rotorcraft Flight Manual
527.1583(h)	Operating Limitations
- 4) Transport Canada Special Conditions
High Intensity Radiated Fields (HIRF), SCA 95-02, April 26, 1995 Lighting Protection, SCA 95-03, April 26, 1995
- 5) Equivalent Safety Findings exist with respect to the following regulations:

-FAR 27.307(b)(5), 27.723, 27.725, and 27.727	Skid Type Undercarriages
-FAR 27.952	Forward Fuel Tank Drop Test
-FAR 27.952	Aft Fuel Tank Drop Test
-FAR 27.965(c)(1) and (2)	Fuel Tank Pressure Test
-FAR 27.1305(p)	Engine Anti-Ice Annunciation

4.0 APPLICABILITY OF AIRWORTHINESS DIRECTIVES

Airworthiness Directives applicable to the Bell 206B, 206L Series, and 407 were reviewed, and none were found to affect this project.

5.0 COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 - 39th Ave N.E.
Calgary, Alberta, T2E 6R7

ORIGINAL DATE: 24 October 2012
REVISION No. 0

CP952

CORRESPONDANCE TO: AERO Design Ltd.
(If other than applicant) 2013 - 39th Ave N.E.
Calgary, Alberta, T2E 6R7

MAKE: Bell
MODEL: 206B, 206L Series, 407

REGISTRATION: All eligible
SERIAL No.: All eligible

NATURE OF WORK: Cyclic Stick Control Friction

TYPE CERTIFICATE DATA SHEET: H-92

MODEL CERTIFICATION BASIS: FAR Part 27, dated 2 October 1964, including amendments 27-1 through 27-30 except as noted (Bell 407)

MODIFICATION CERTIFICATION BASIS: FAR Part 27, dated 2 October 1964, including amendments 27-1 through 27-30 except as noted (Bell 407)

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
---------------------------	---	------------------------	-----	-----	----------

Subpart B - Flight

27.29	Empty weight and corresponding C of G	N/A	No change configuration	from	Type	Approved
-------	---------------------------------------	-----	-------------------------	------	------	----------

Subpart D - Design and Construction

27.601	Design	Use of conventional design	X			
27.603	Materials		X			
27.605(a)	Fabrication Methods		X			
27.607(b)	Fasteners		X			
27.609	Protection of Structure		X			
27.611	Inspection Provisions	No change from Type Approved configuration	X			

27.679(a)	Control system locks – warning engaged	Statement in report	**	No change from Type Approve config
27.679(b)	Control system locks – in flight	Cockpit evaluation	**	
27.777	Cockpit Controls	Statement in Report	**	

Subpart G - Operating Limitations and Information

27.1529	Instructions for Continued Airworthiness	ICA provided	X	Instructions provided in the existing Flight Manual are applicable without change. Additional instructions on use of friction are provided.
27.1581	Rotorcraft Flight Manual - General	FMS provided	X	
27.1585	Operating Procedures	FMS provided	X	

6.0 COMPLIANCE WITH FAR 27.777 COCKPIT CONTROLS

Cockpit controls must be--

- (a) Located to provide convenient operation and to prevent confusion and inadvertent operation; and
- (b) Located and arranged with respect to the pilots' seats so that there is full and unrestricted movement of each control without interference from the cockpit structure or the pilot's clothing when pilots from 5'2" to 6'0" in height are seated.

The Cyclic Friction Replacement control is located in the identical location as the Type Approved cyclic friction supplied by Bell Helicopter. Located under the pilot's left leg, protruding forward from out under the pilot's seat, it is similarly convenient for the pilot to reach and operate as the Type Approved configuration. There are no other controls located close to this location to cause confusion.

The Cyclic Friction Replacement control can be operated without interference with cockpit structure and is so located such that it is free from contact with the pilot's clothing.

7.0 COMPLIANCE WITH FAR27.679 CONTROL SYSTEM LOCKS

Control system locks.

If there is a device to lock the control system with the rotorcraft on the ground or water, there must be means to--

- (a) Give unmistakable warning to the pilot when the lock is engaged; and
- (b) Prevent the lock from engaging in flight.

Compliance with FAR27.679(a)

The Cyclic Stick Friction Replacement is no different than the Type Approved Bell configuration with respect to compliance with this paragraph. The Bell Helicopters Approved flight manual for each of the applicable models has an instruction first to remove cyclic friction and then later to set cyclic friction as desired in the engine start-up and/or engine run-up sections of the Normal Procedures.

The Cyclic Stick Friction Replacement has these same instructions in the Engine Run-up section of the Flight Manual Supplement.

Compliance with FAR27.679(b)

A cockpit assessment was completed by inspecting two (2) Bell 407 helicopters; one with the original Bell configuration and one with the Aero Design Cyclic Stick Friction Replacement. Photographs were taken and are shown in Appendix A

Conclusions from Assessment:

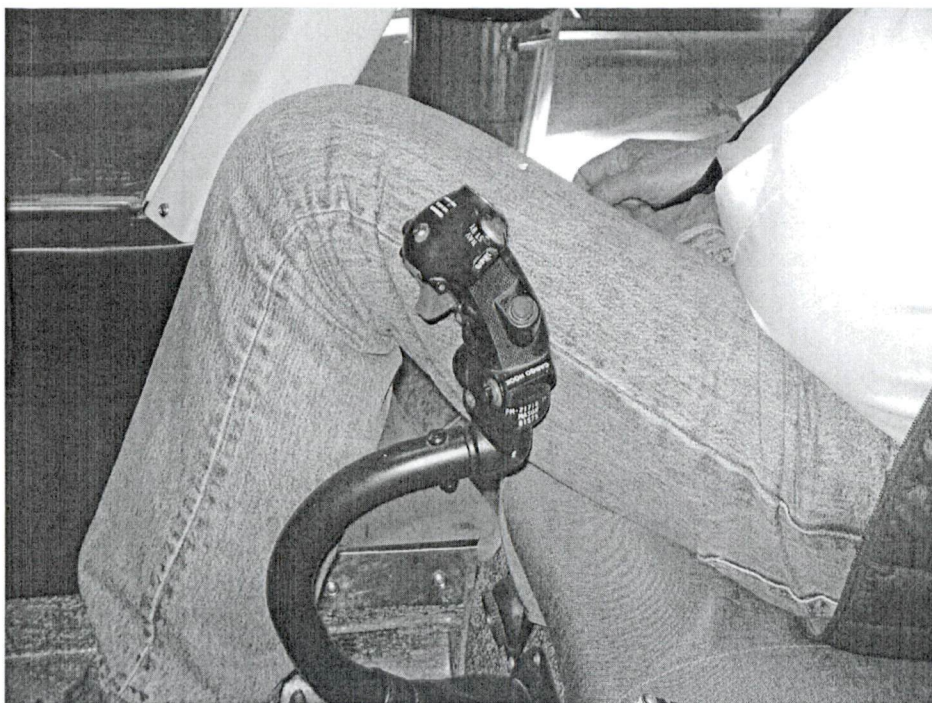
- 1) The cyclic friction lever does not touch any structure or the cyclic stick ass'y in any position within the limits of travel of either the friction lever or the cyclic stick.
- 2) There is a pinch point where the pilot's fingers could get caught between the end of the cyclic friction lever and the cyclic stick ass'y, but only if the cyclic stick is positioned into the extreme forward left position. This has been dealt with thru a warning to avoid positioning the cyclic friction lever in the quadrant of travel where this may occur.
- 3) It is not realistic to believe that a passenger could in any way inadvertently alter the collection friction and it is even less likely that a passenger could increase cyclic stick friction.
Pilot's foot-well with the centre console in the way.
- 4) It is not reasonable to think that the pilot would add friction by kicking the friction lever.
 - awkward position for the pilot to get his foot
 - in flight his feet are going to be comfortably resting on the rudder pedals.
- 5) The cyclic stick friction replacement design cannot be inadvertently applied to lock up the cyclic control in flight such that continued safe flight cannot be maintained.

APPENDIX A COMPLIANCE WITH FAR27.679(B)

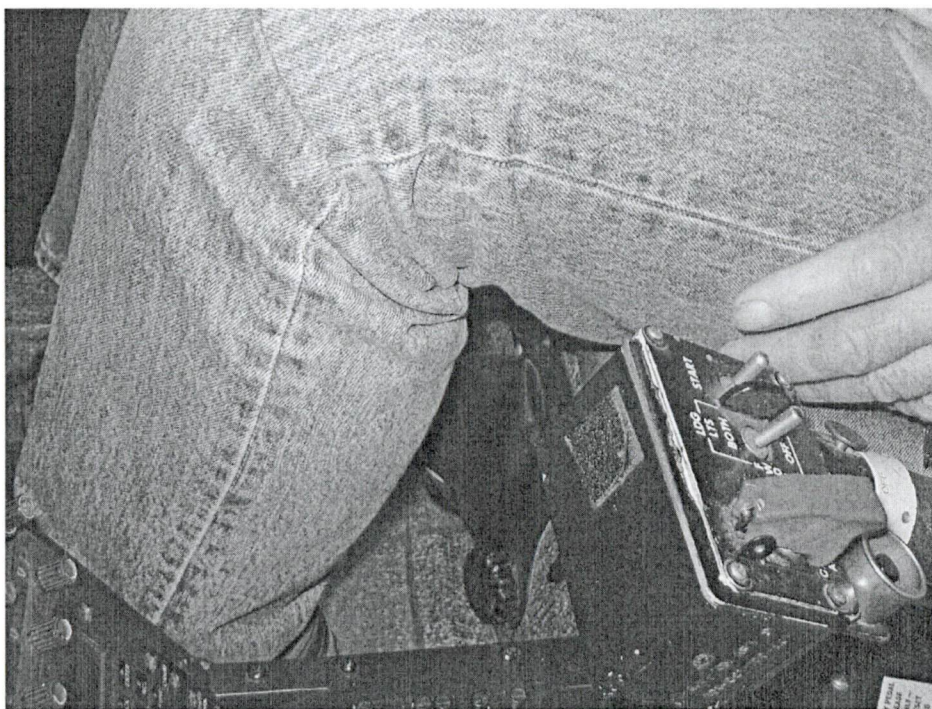
The following pictures show various positions of person seated in the pilot seat the relative position of the Cyclic Stick Friction:

- Pic 1 Getting in. Left leg on right side of cyclic
- Pic 2 Feet flat on floor as a passenger would have them off the rudder pedals in a comfortable position
(round knob is the Bell knob for the cyclic friction, lever from mod is in same location)
- Pic 3 Left foot purposely brought back and heel put on knob. Not a natural or comfortable position
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- Pic 4 Left foot flat on floor and right foot on rudder pedal
- Pic 5 Normal pilot flight position, both feet on rudder pedals
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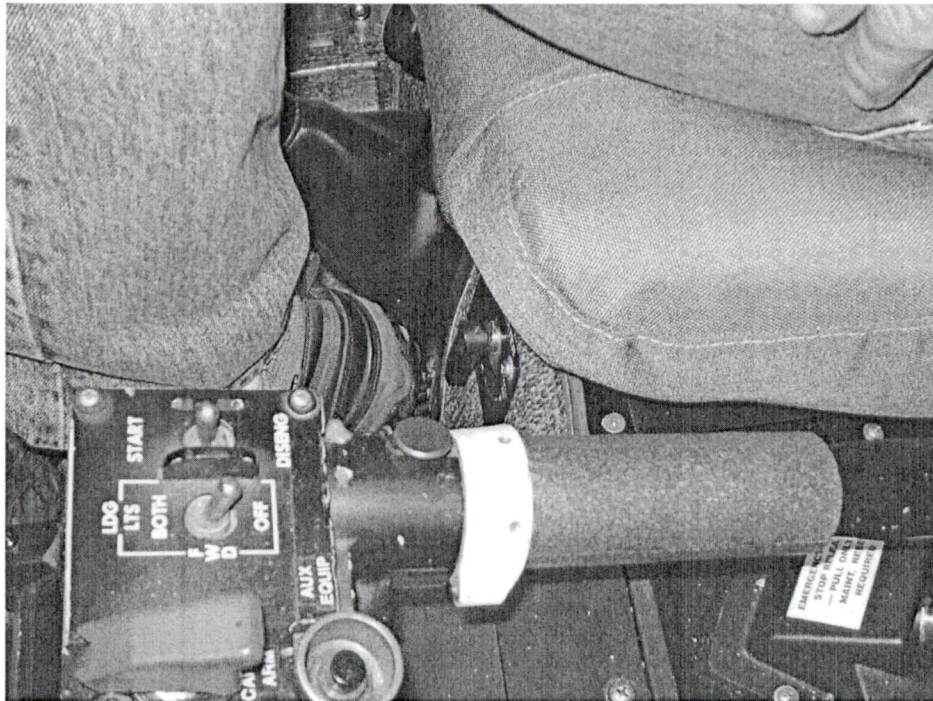
- Pic 8 Looking vertically down between legs, both feet on rudder pedals, left rudder fully depressed.
- Pic 9 Looking vertically down
- Pic 11 Looking aft from between feet which are on rudder pedal
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 - Fabric boot undone and moved out of way
 - Cyclic friction handle positioned so that it is in the closest possible location to any part on the cyclic stick -- which happens to be the bolt head
 - Cyclic stick positioned to the forward/left quadrant in such a way as to get it as close as possible to the end of the friction handle
 - Measured clearance 0.214 inches.
- Pic 15 Friction lever rotated 180 degrees from shown pic 13 & 14
 - Close to wall when lever in the "full over" position but still has 3/16"
 - 1/4" clearance with the wall forming the front of the seat structure.
 - In "full over" position the lever does not touch any structure at any azimuth about the axis of the threaded rod.
- Pic 16 Carpet being pushed back to show clearance
- Pic 17 Looking vertically down



Pic 1



Pic 2



Pic 3



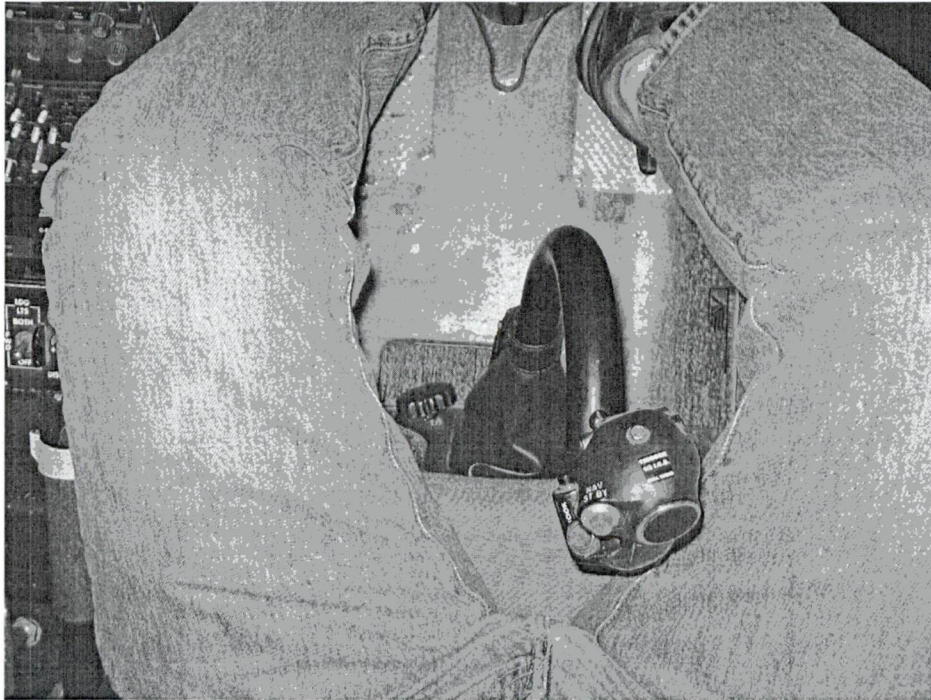
Pic 4



Pic 5



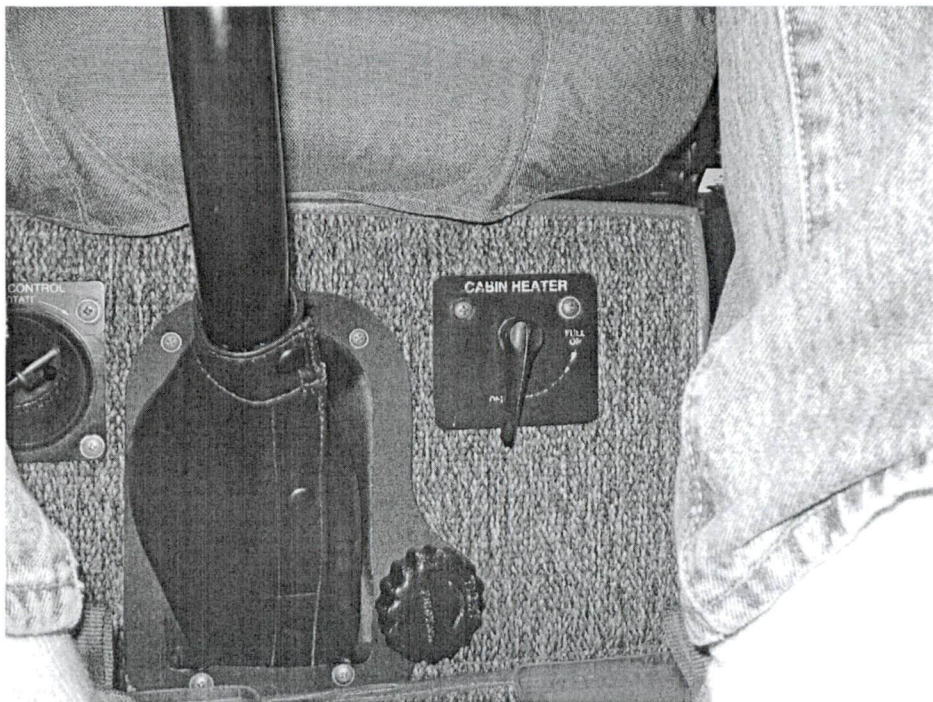
Pic 6



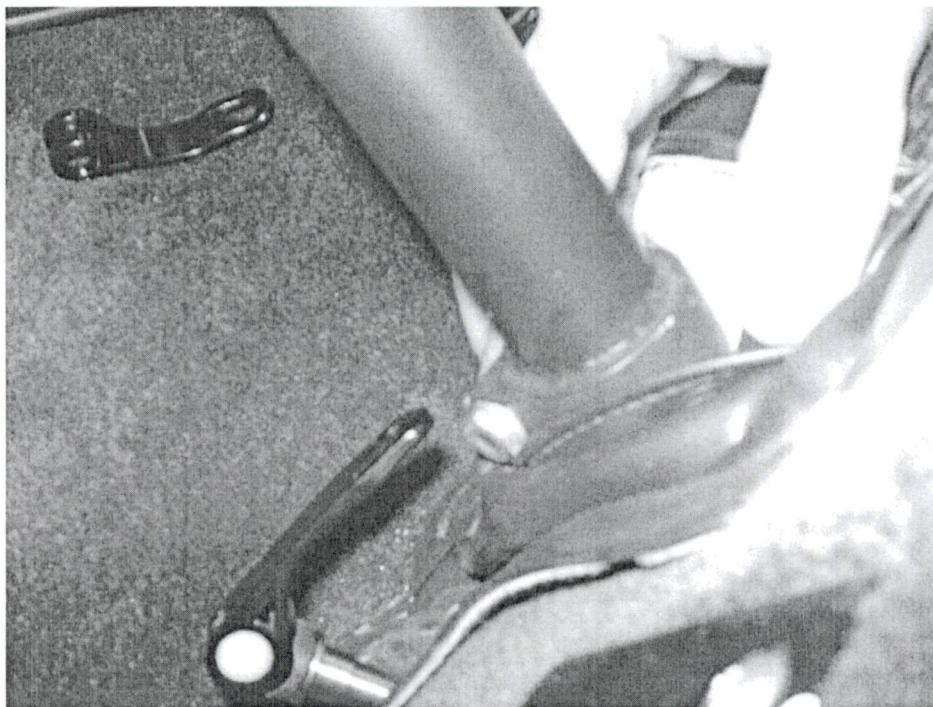
Pic 8



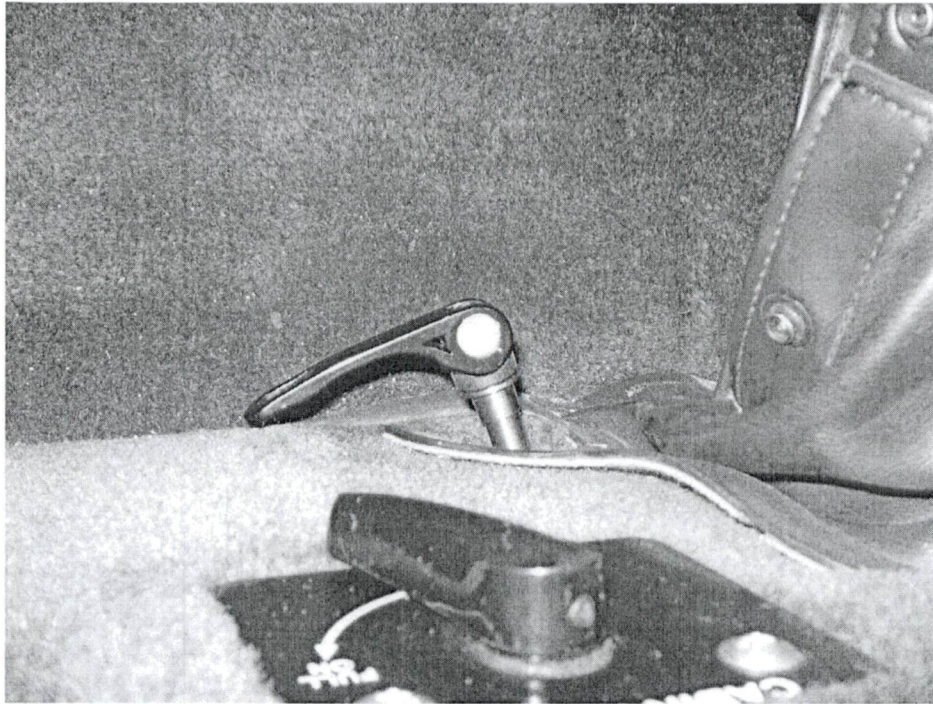
Pic 9



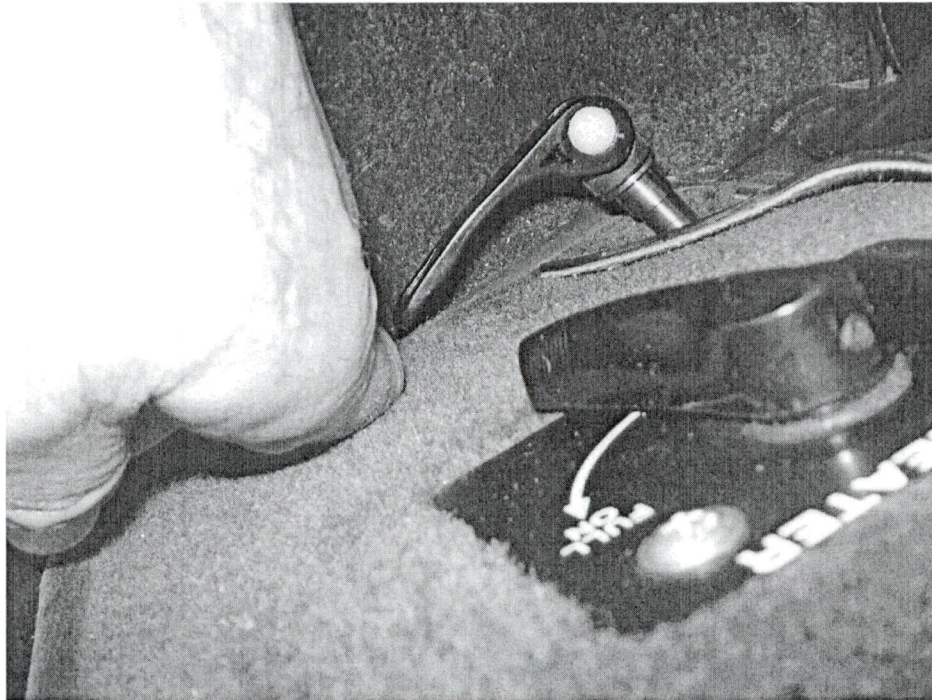
Pic 11



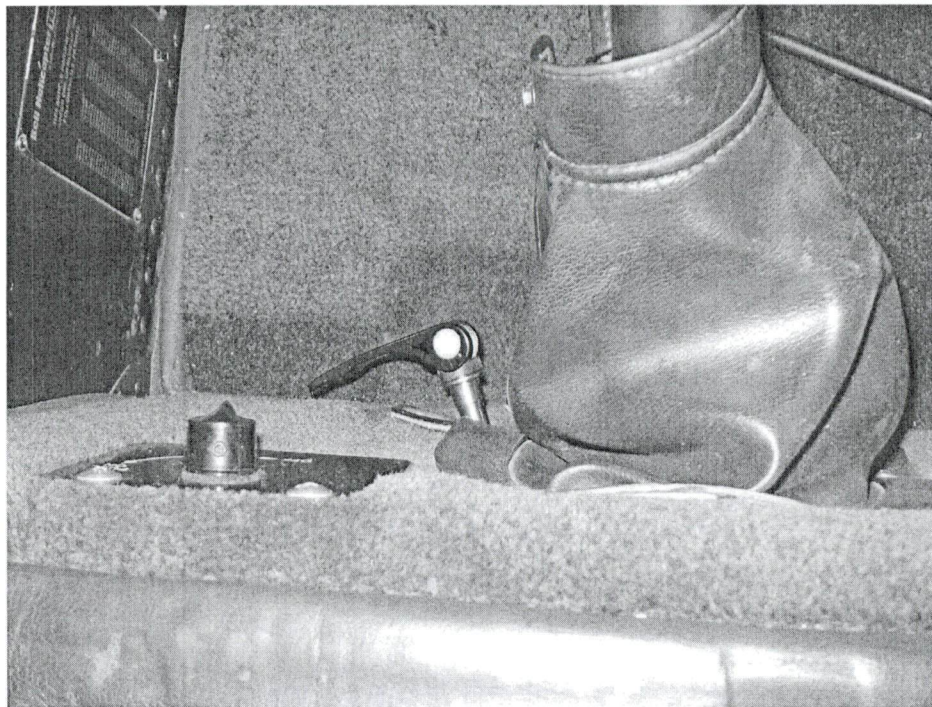
Pic 13



Pic 15



Pic 16



Pic 17

Ted Burgoin

From: Staal, Jack [Jack.Staal@tc.gc.ca]
Sent: Thursday, November 22, 2012 10:25 AM
To: 'Ted Burgoin'
Cc: Brulotte, Michel
Subject: RE: Cyclic Friction

Ted

OK with me then

Jack

From: Brulotte, Michel
Sent: Thursday, November 22, 2012 10:22 AM
To: 'Ted Burgoin'
Cc: Staal, Jack
Subject: RE: Cyclic Friction

That works for me.

Michel

From: Ted Burgoin [mailto:ted@aerodesign.ca]
Sent: November 22, 2012 12:08 PM
To: Brulotte, Michel
Cc: Staal, Jack
Subject: RE: Cyclic Friction

The flight manual supplement has the cyclic friction check in the Engine Run-up Check section

First the friction is to be removed
Finally the friction is to be set as desired.

Attached is the section from the 206B Flight Manual. The flight manuals for the other models have similar sections.

If you are happy that this covers compliance with 679(a) then I'll put that in as a "no change" on the CP and explanation that checks existing in the FM as the explanation.
Will do a write-up with pics in the engineering report for compliance with 679(b)

That ok with you Jack?

Ted.

From: Brulotte, Michel [mailto:michel.brulotte@tc.gc.ca]
Sent: Thursday, November 22, 2012 7:21 AM
To: 'Ted Burgoin'
Subject: RE: Cyclic Friction

Ted,

11/27/2012

Ted Burgoin

From: Brulotte, Michel [michel.brulotte@tc.gc.ca]

Sent: Thursday, November 22, 2012 10:22 AM

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From: Brulotte, Michel [mailto:michel.brulotte@tc.gc.ca]

Sent: Thursday, November 22, 2012 7:21 AM

To: 'Ted Burgoin'

Subject: RE: Cyclic Friction

Ted,

I just spoke with two of Michael's flight control colleagues and they agree that any system that is installed in the aircraft which could lock the controls needs to meet the 27.679 requirements.

The B206 was originally certified under CAR 6, which states in part:

6.322 *Control system locks.*

If a device is provided for locking the control system while the rotorcraft is on the ground or water, the provisions of paragraphs (a) and (b) of this section shall apply.

(a) A means shall be provided to give unmistakable warning to the pilot when the locking device is engaged.

(b) Means shall be provided to preclude the possibility of the lock becoming engaged during flight.

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The Bell 206 was originally certified by the FAA, and Canada became the state of design in the 1990s. I do not know what was done to substantiate the cyclic friction and how it met CAR 6.322 and FAR 27.679, but the design of the cyclic friction was much less susceptible to locking the controls than the design you are proposing, and pretty much immune from inadvertent locking in flight.

I don't think we need to get too worried about the 679a requirement since it can be met in the original and the STC design by doing a flight control check prior to engine start and flight. In my opinion, the 679b requirement can be met by showing that once the flight control check has been done that the pilot/passengers cannot inadvertently engage the lock in flight, which from the pictures I saw looked to be obvious.

Let me know if you need more from me.

Thanks,

Michel

From: Ted Burgoin [mailto:ted@aerodesign.ca]

Sent: November 21, 2012 6:19 PM

To: Brulotte, Michel

Subject: RE: Cyclic Friction

Michel/Jack:

Have considered 27.679 during the initial evaluation of the project.
I believe there is a problem with putting 27.679 in the compliance program.

As you have stated, there is no particular problem complying with 679(b)..... "prevent the lock from engaging in flight"

The problem is that if you once call it a control lock then you are obliged to comply with 679(a) "unmistakeable warning to the pilot when the lock is engaged"

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I speculate that Bell did not evaluate the cyclic friction as a "control system lock" in the certification process and therefore 679(a) was not applicable. I can't see how else this could have occurred, unless it is covered by a relaxation of the requirement in private correspondence between Bell and Transport during certification. Nowhere in any Bell document (FMS, IPC, Maintenance Manual/ICA's) is the cyclic friction referred to as a control lock or suggested that it be used for that purpose. The Bell cyclic friction design goes across numerous models starting with the model 47 and including the 407 as relatively new design. Have not checked what the 427 or 429 use.

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11/27/2012

Sent: Friday, November 16, 2012 7:22 AM

To: 'Ted Burgoin'; Staal, Jack

Subject: RE: Cyclic Friction

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It looks like there will not be a problem based on the pictures.

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From: Ted Burgoin [mailto:ted@aerodesign.ca]

Sent: November 15, 2012 3:00 PM

To: Staal, Jack; Brulotte, Michel

Subject: Cyclic Friction

This is the first of three (3) e-mails with pictures taken on 15 Nov 2012

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11/27/2012

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11/27/2012

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Ted Burgoin

From: Brulotte, Michel [michel.brulotte@tc.gc.ca]
Sent: Thursday, November 22, 2012 6:28 AM
To: 'Ted Burgoin'
Subject: RE: Cyclic Friction

I think the only way around this is for me to speak with Michael Cohen who is a flight controls specialist.

One way to comply with 679a could be doing a flight control check prior to takeoff, which pilots always do, so once that is done the only issue is inadvertent reengagement.

Michel

From: Ted Burgoin [mailto:ted@aerodesign.ca]
Sent: November 21, 2012 6:19 PM
To: Brulotte, Michel
Subject: RE: Cyclic Friction

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11/27/2012

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From: Brulotte, Michel [michel.brulotte@tc.gc.ca]
Sent: Friday, November 16, 2012 3:17 PM
To: Ted Burgoin; Staal, Jack
Subject: RE: Cyclic Friction

I have not seen the report that Bell produced. The fact is that the original cyclic friction device requires the pilot to consciously tighten the friction beyond normal levels. The device that you are using to replace it could conceivably be tightened well beyond acceptable levels with a single input. I don't think that the statement required needs to be onerous, but saying that the pilot could not bump the friction lever inadvertently on the ground or in flight and providing the photos showing what would have to be done to do so should be sufficient.

Anyway, that is my point of view.

Michel

From: Ted Burgoin [ted@aerodesign.ca]
Sent: November 16, 2012 4:12 PM
To: Brulotte, Michel; Staal, Jack
Subject: RE: Cyclic Friction

I have considered 27.679

As far as I can see, Bell does not consider this to be a "control lock". Nowhere in the basic Flight Manual or Maintenance Manual of the 206B, any of the 206L series or the 407 is there any mention of "control lock". The term used by Bell is "friction". There is a "minimum friction" that is a requirement in the maintenance manual and then there is "additional friction".

If we call the Bell "friction device" a "control lock" then one would expect that Bell to have made a finding of compliance with 27.679(a).
I don't see that in the design.
Conclusion, this is a friction device not a control lock.

I have addressed this issue in our report ER952.01 as follows:

7.0 compliance with FAR27.769 control system locks

Control system locks.

If there is a device to lock the control system with the rotorcraft on the ground or water, there must be means to--

- (a) Give unmistakable warning to the pilot when the lock is engaged; and
- (b) Prevent the lock from engaging in flight.

Compliance with FAR27.769 was carefully considered during design as to whether the cyclic stick friction is a control lock or not. It was considered that the device is a cyclic stick friction device and not a control lock and that this is how it was considered during original Type Design and certification. If considered a control lock, then the Type Approved configuration is non-compliant with 27.769(a).

The Cyclic Stick Replacement is no different than the Type Approved Bell configuration with respect to this paragraph.

So in practical terms:

- a) What happens if "friction" is added.
 - friction is applied by clamping on a ball approx 1.25" in dia at the bottom of the stick
 - cyclic stick is about 18" long so you really have some leverage

our experience playing with this is that with either the Bell system or our mod system you really have to "reef up" to get it to the point where it gets "really stiff" to move the cyclic stick

- with either the Type Approve Bell system or our mod system it is not probable that an inadvertent action would tighten up the friction to the point where the stick can't be moved.

b) Can an inadvertent action increase friction?

- the only thing that I can think of that is remotely possible is that the pilot remove his foot from the rudder pedal in flight and apply "load" to the friction.

- if you can make the argument that the heel of the pilot's shoe can apply pressure to the end of the lever, then

I can argue that the same heel of the pilot's shoe can be applied to the top of the Bell knob and twisted laterally alternating the friction in the Type Approved configuration.

c) Are we changing what "might happen" by changing the part.

- with Type Approved Bell

I don't think there is a real issue here. Further, I don't see any difference in the level of safety from the Type Approved configuration Maybe Michel needs to try one.

Ted.

From: Brulotte, Michel [mailto:michel.brulotte@tc.gc.ca]
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To: 'Ted Burgoin'; Staal, Jack
Subject: RE: Cyclic Friction

Ted,

I think that there needs to be a statement that finds compliance with 27.679.

It looks like there will not be a problem based on the pictures.

Michel

From: Ted Burgoin [mailto:ted@aerodesign.ca]
Sent: November 15, 2012 3:00 PM
To: Staal, Jack; Brulotte, Michel
Subject: Cyclic Friction

This is the first of three (3) e-mails with pictures taken on 15 Nov 2012

Pic 1 Getting in. Left leg on right side of cyclic

Pic 2 Feet flat on floor as a passenger would have them off the rudder pedals in a comfortable position

(round knob is the Bell knob for the cyclic friction, lever from mod is in same location

Pic 3 Left foot purposely brought back and heel put on knob. Not a natural or comfortable position

Certainly a pilot would not do this in flight

Pic 4 Left foot flat on floor and right foot on rudder pedal

Pic 5 Normal pilot flight position, both feet on rudder pedals

Pic 6 Normal pilot flight position, both feet on rudder pedals

Pic 8 Looking vertically down between legs, both feet on rudder pedals, left rudder fully depressed.

Pic 9 Looking vertically down

Pic 10 Same

Pic 11 Looking aft from between feet which are on rudder pedal

Pic 12 Looking aft from between feet which are flat on floor

Pic 13 Cyclic friction mod installed in 407

- Fabric boot undone and moved out of way

- Cyclic friction handle positioned so that it is in the closest possible

location to any part on the cyclic stick -- which happens to be the bolt head

- Cyclic stick positioned to the forward/left quadrant in such a way as to

get it as close as possible to the end of the friction handle

- Measured clearance 0.214 inches.

Pic 14 Same as pic 13

Pic 15 Friction lever rotated 180 degrees from shown pic 13 & 14

- Close to wall when lever in the "full over" position but still has 3/16" - 1/4" clearance with the wall forming the front of the seat structure.

- In "full over" position the lever does not touch any structure at any azimuth about the axis of the threaded rod.

Pic 16 Carpet being pushed back to show clearance

Pic 17 Looking vertically down

My conclusions:

1) The cyclic friction lever does not touch any structure or the cyclic stick ass'y in any position within the limits of travel of either the friction lever or the cyclic stick.

2) There is a pinch point where the pilot's fingers could get caught between the end of the cyclic friction lever and the cyclic stick ass'y, but only if the cyclic stick is positioned into the extreme forward left position.

This has been dealt with thru a warning to avoid positioning the cyclic friction lever in the quadrant of travel where this may occur.

3) It is not realistic to believe that a passenger could in any way inadvertently alter the collection friction and it is even less likely that a passenger could increase cyclic stick friction.

Pilot's foot-well with the centre console in the way

4) I don't think it is reasonable to think that the pilot would add friction by kicking the friction lever.

- awkward position for the pilot to get his foot

- in flight his feet are going to be comfortably resting on the rudder pedals.

Ted

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

www.aerodesign.ca

01 November 2012

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File : C-12-0917

Our File : 952

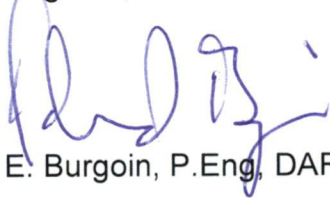
Re: Bell Light Helicopter Cyclic Friction Replacment

Jack,

Please extend my delegation to include the following paragraphs as indicated in Compliance Program CP952, which is uploaded to NAPA:

FAR 27.777 - Cockpit Controls

Regards,



E. Burgoin, P.Eng, DAR 290M

Encl.

BELL 206B
BELL 206L Series
BELL 407

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT
for the
**INSTALLATION of the AERO DESIGN
CYCLIC FRICTION REPLACEMENT**

Canadian Supplemental Type Certificate No. SH12-XX
FAA Supplemental Type Certificate No. _____

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 206B, 206L Series, or 407 when fitted with the Cyclic Friction Replacement. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	3
V	Operating Information	4

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	26 Oct 2012	None		

I LIMITATIONS

No change from basic Approved Flight Manual.

II NORMAL PROCEDURES

No change from basic Approved Flight Manual.

Note: Application of additional cyclic friction is achieved by rotating cam lever aft. See section V for further instructions.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

No change from basic Approved Flight Manual.

V OPERATING INFORMATION

The pilot may increase friction beyond the minimum as set by rotating the cam lever to the closed position.

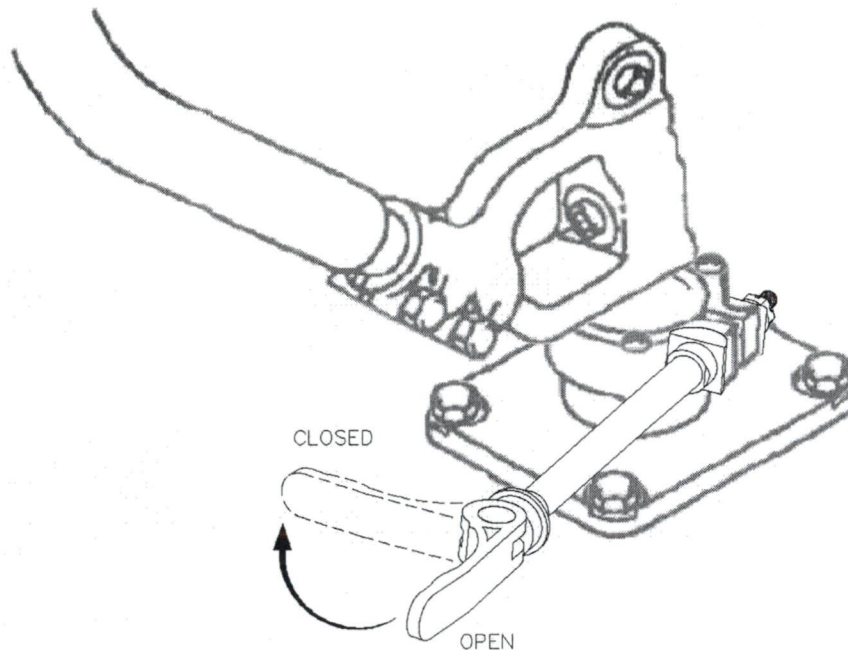


Figure V.1 – Cyclic Friction Operation

To adjust the amount of friction provided by the cam action above the minimum friction:

1. Set cam lever to OPEN position (straight out).
2. Turn lever clockwise to increase friction, counter-clockwise to reduce friction
3. Rotate cam lever to CLOSED position (perpendicular to shaft) to check friction.

CAUTION

Avoid setting the cam lever where the CLOSED position points between the 9 o'clock and 12 o'clock position when looking aft, see figure V.2.

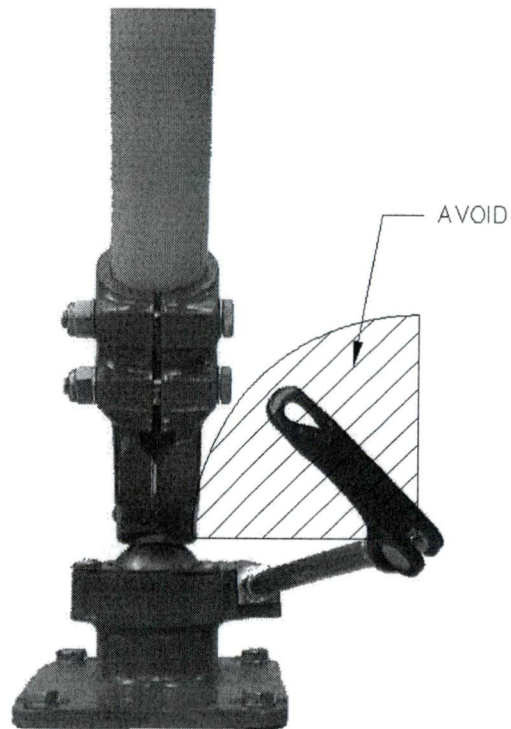


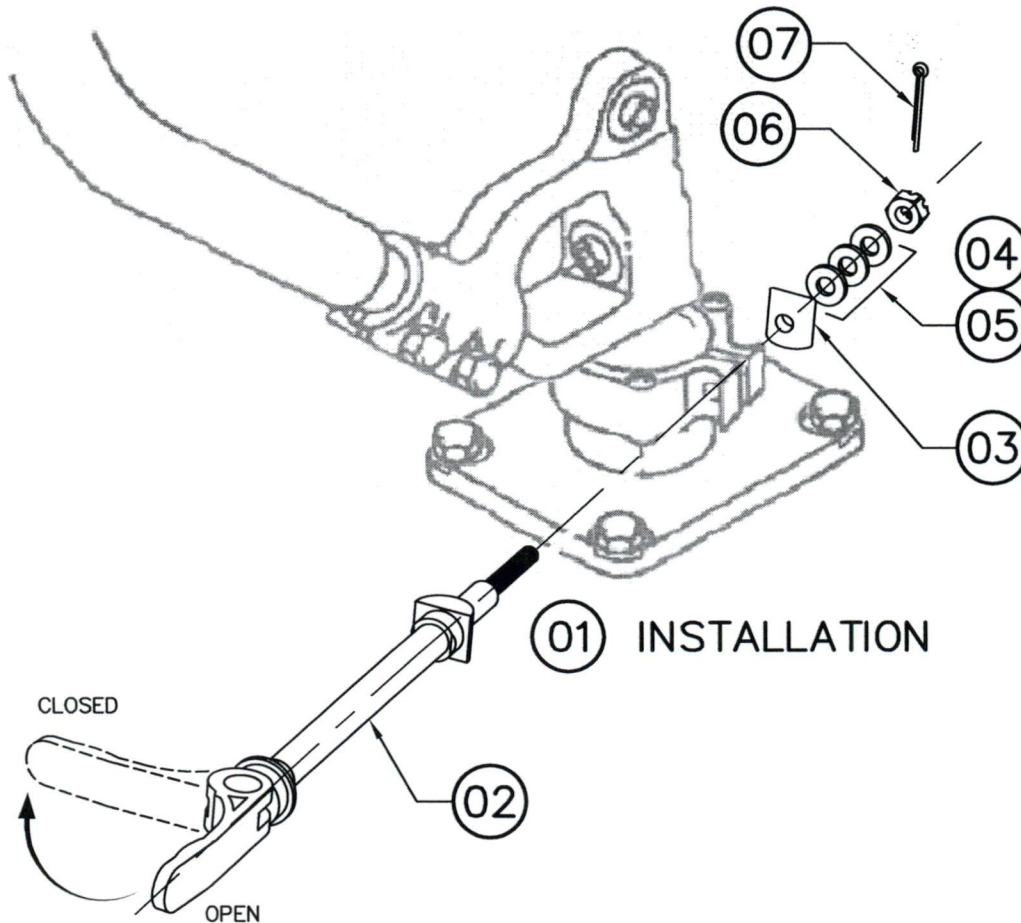
Figure V.2 – Cam Lever Avoid Region
(Looking aft)

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NOTES

- REMOVE THE EXISTING CYCLIC FRICTION ASSEMBLY AS FOLLOWS:
 - REMOVE PILOT SEAT AND SEAT PANEL. REFER TO MAINTENANCE MANUAL CHAPTER 25.
 - REMOVE COTTER PIN, NUT AND WASHERS AT BOTTOM OF CYCLIC FRICTION KNOB AND SHAFT ASSEMBLY.
 - UNTHREAD BARREL NUTS FROM KNOB AND SHAFT ASSEMBLY.
 - REMOVE KNOB AND SHAFT ASSEMBLY FROM PIVOT SUPPORT ASSEMBLY, AND SLIDE OUT OF CYCLIC STICK BOOT.
- INSTALL NEW CYCLIC FRICTION ASSEMBLY (02) AS FOLLOWS:
 - SLIDE CYCLIC FRICTION ASSEMBLY (02) THROUGH CYCLIC BOOT, SEAT CURVED END INTO PIVOT SUPPORT ASSEMBLY.
 - SLIDE CURVED WASHER (03) ONTO THREADED END OF CYCLIC FRICTION.
 - SLIDE NAS1149F0363P AND/OR NAS1149F0332P WASHERS (AS REQUIRED) ONTO THREADED END OF CYCLIC FRICTION.
 - THREAD AN310-3 CASTLE NUT ONTO THREADED END OF CYCLIC FRICTION.
 - SET MINIMUM FRICTION WITH LEVER IN OPEN POSITION (STRAIGHT OUT) IN ACCORDANCE WITH THE MAINTENANCE MANUAL:
 - 206B: BHT-206A/B-MM-8, SECTION 67-39
 - 206L: BHT-206L-MM-1, SECTION 27-27A
 - 206L-1: BHT-206L1-MM-1, SECTION 27-28
 - 206L-3: BHT-206L3-MM-8, SECTION 67-40
 - 206L-4: BHT-206L3-MM-8, SECTION 67-40
 - 407: BHT-407-MM-8, SECTION 67-56
 - SAFETY THE AN310-3 NUT WITH MS24665-153 COTTER PIN IN ACCORDANCE WITH AC43.13-1B, SECTION 7-127.
 - INSTALL PILOT SEAT AND SEAT PANEL. REFER TO MAINTENANCE MANUAL CHAPTER 25.
 - PILOT MAY INCREASE FRICTION BY ROTATING LEVER TO CLOSED POSITION.
- ELIGIBILITY: 206B - S/N 1658 AND SUBSEQUENT
206L, L-1, L-3, L-4 - ALL
407 - ALL



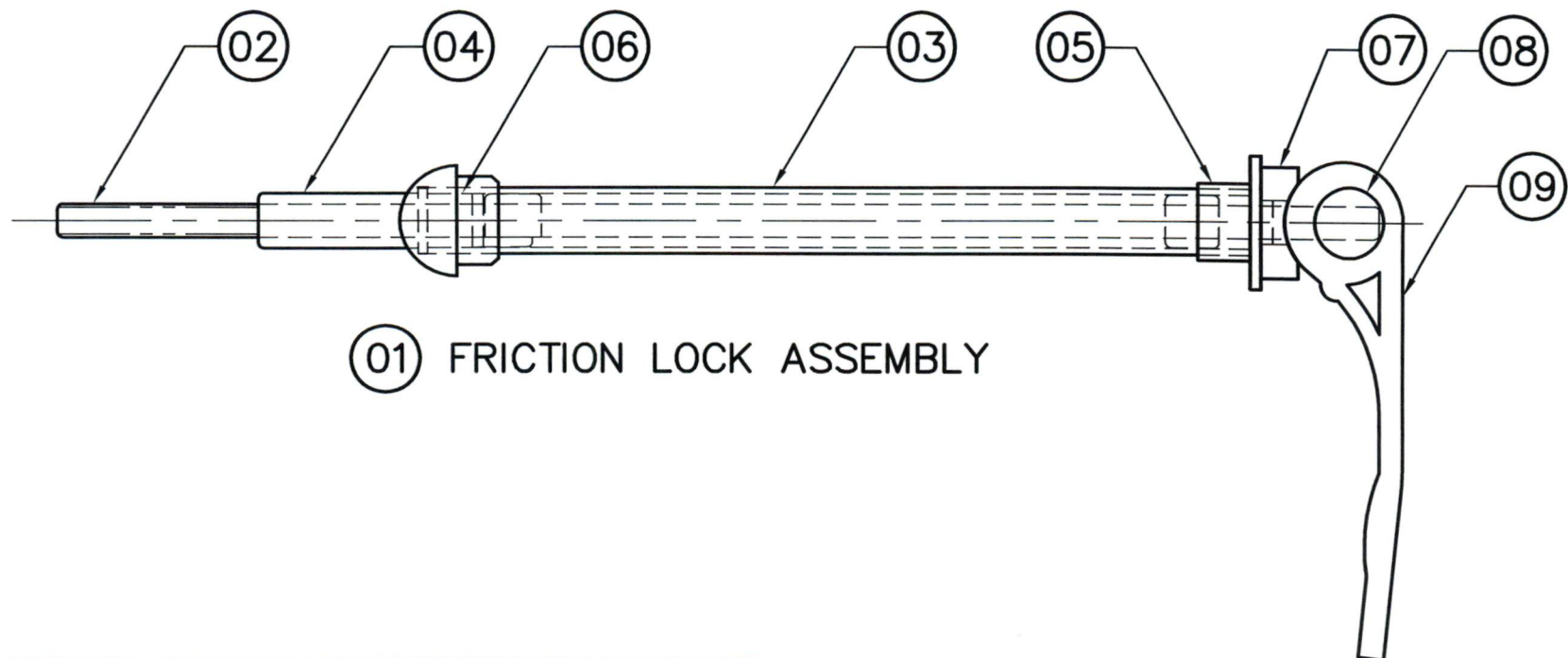
				APPROVALS		DATE		<div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M</div> <div>2013 – 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7</div> <div>tel: (403) 250-8027 fax: (403) 250-8333 www.aerodesign.ca</div>							
				DRAWN: JEFF CLARKE		25 OCT 2012									
				CHECKED: E. BURGOIN											
				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		BELL 206B, 206L SERIES, 407 CYCLIC FRICTION INSTALLATION									
						NOT TO SCALE		DWG. SIZE		DWG. NO.		REV.			
						SHEET 1 OF 1		A4		95201		0			
QTY				LIST OF MATERIALS											
1				MS24665-153 07		COTTER PIN									
1				AN310-3 06		CASTLE NUT									
A/R				NAS1149F0332P 05		WASHER (LIGHT)									
A/R				NAS1149F0363P 04		WASHER									
1				95238-01 03		CURVED WASHER									
1				95210-01 02		CYCLIC FRICTION ASSEMBLY									
				95201-01 01		CYCLIC FRICTION INSTALLATION									
01				PART NO.		ITEM		DESCRIPTION							

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NOTES

1. PRESS RETAINER BUSHING (05) INTO TUBE (03), INSERT THREADED ROD ASSEMBLY (02) INTO TUBE, PRESS CAP (04) ONTO TUBE, THEN PRESS TUBE ASSEMBLY (03, 04, 05) INTO CRESCENT BUSHING (06).
2. SLIDE CURVED WASHER (07) OVER THREADED ROD, INSERT BARREL NUT (08) INTO CAM LEVER (09), THEN THREAD CAM LEVER ONTO THREADED ROD. DO NOT TIGHTEN.



(01) FRICTION LOCK ASSEMBLY

1	MODEL 1100	09	CAM LEVER (HYGOAL)
1	95230-01	08	BARREL NUT
1	95228-01	07	CURVED WASHER
1	95226-01	06	CRESCENT BUSHING
1	95224-01	05	CAP
1	95222-01	04	RETAINER BUSHING
1	95220-01	03	TUBE
1	95212-01	02	THREADED ROD ASSEMBLY
1	95210-01	01	FRICTION LOCK TUBE ASSEMBLY
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LIST OF MATERIALS			

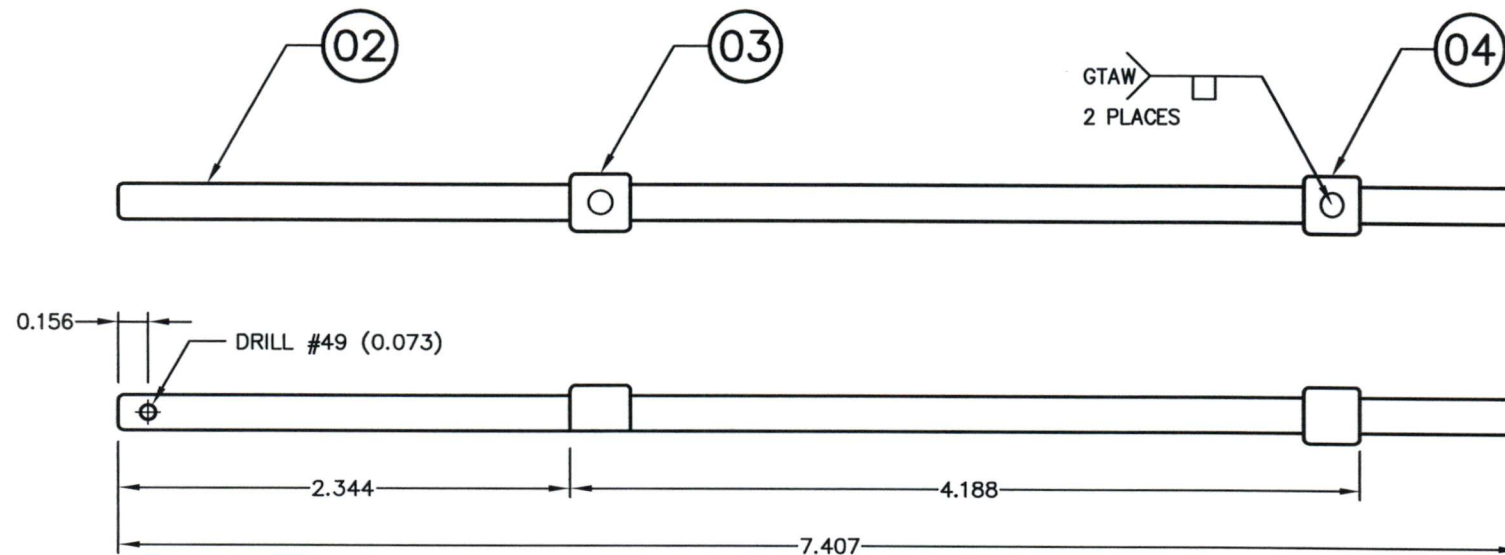
APPROVALS	DATE
DRAWN: JEFF CLARKE	18 OCT 2012
CHECKED: E. BURGON	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2°
X.XX ±0.03
X.X ±0.1

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BELL 206B, 206L SERIES, 407 CYCLIC FRICTION LOCK FRICTION LOCK ASSEMBLY			
SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	A4	95210	0

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01 THREADED ROD ASSEMBLY

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. WELDING OF 304 STAINLESS STEEL TO BE COMPLETED BY GTAW METHOD TO AMS2685C.
WELDING ROD SHALL CONFORM TO ER308L OR EQUIVALENT.

1	95236-01	04	STOP
1	95234-01	03	STOP
1	95232-01	02	THREADED ROD
	95212-01	01	THREADED ROD ASSEMBLY
QTY	PART NO.	ITEM	DESCRIPTION
LIST OF MATERIALS			

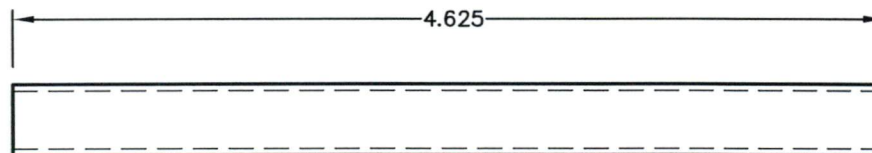
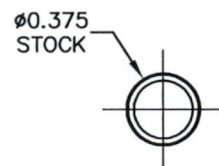
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SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.	
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NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.



01 TUBE

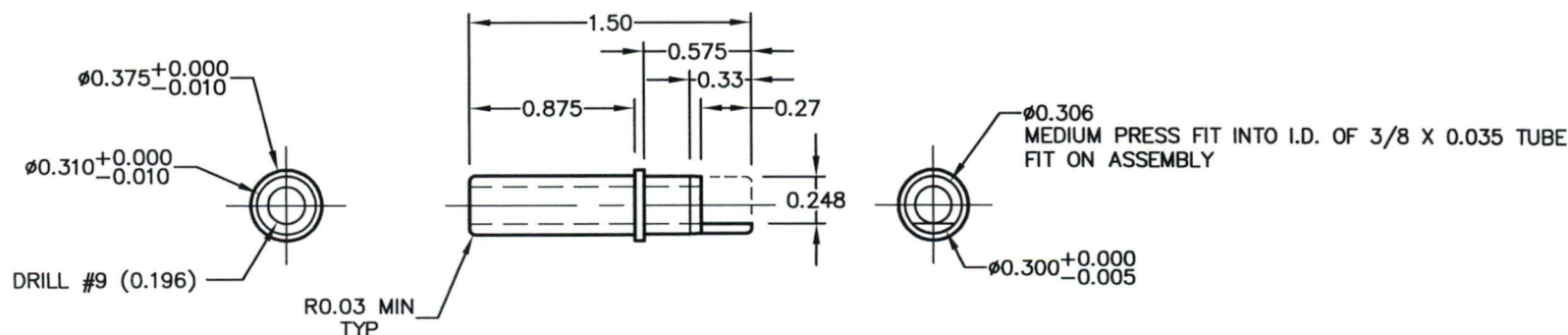
	95220-01	01	TUBE	304 STAINLESS STEEL	ASTM A269	ø0.375 X 0.035 TUBE					
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE					
QTY	LIST OF MATERIALS										
			APPROVALS	DATE	AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8087 fax: (403) 250-8333 www.aerodesign.ca						
			DRAWN: JEFF CLARKE	18 OCT 2012							
			CHECKED: E. BURGON								
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								SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
								SHEET 1 OF 1	A4	95220	0

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NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.



01 RETAINER BUSHING

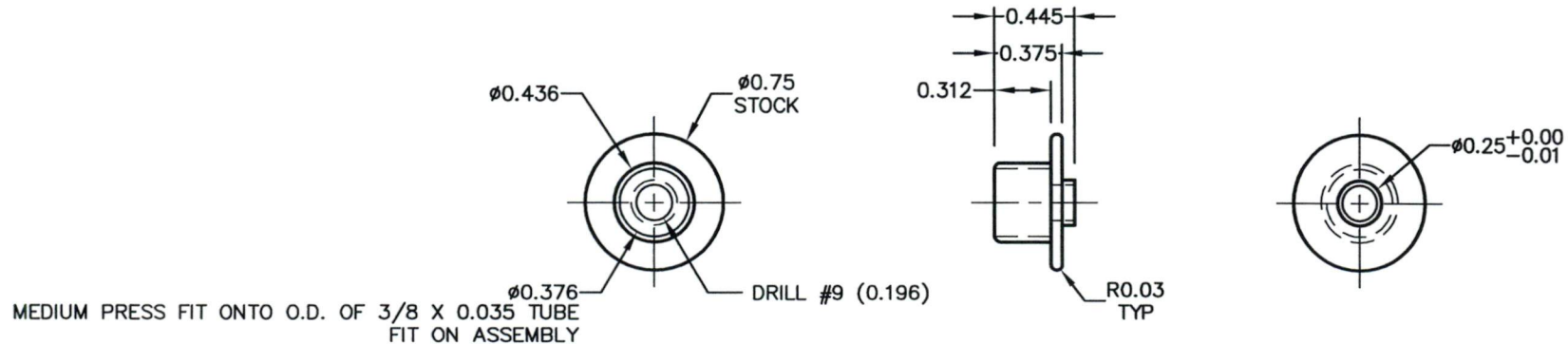
	95222-01	01	RETAINER BUSHING	304 STAINLESS STEEL	ASTM A479	Ø0.375 ROD	
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE	
QTY	LIST OF MATERIALS						
			APPROVALS	DATE	AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8087 fax: (403) 250-8333 www.aerodesign.ca		
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			CHECKED: E. BURGAIN				
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SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.			
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NOTES

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01 CAP

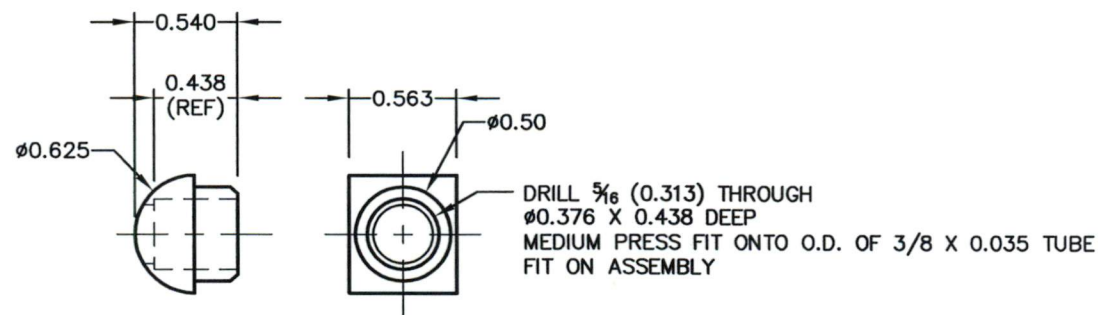
		95224-01		01	CAP		304 STAINLESS STEEL		ASTM A479		Ø0.75 ROD	
01	PART NO.		ITEM	DESCRIPTION			MATERIAL		MATERIAL SPEC		STOCK SIZE	
QTY		LIST OF MATERIALS										
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NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.



01 CRESCENT BUSHING

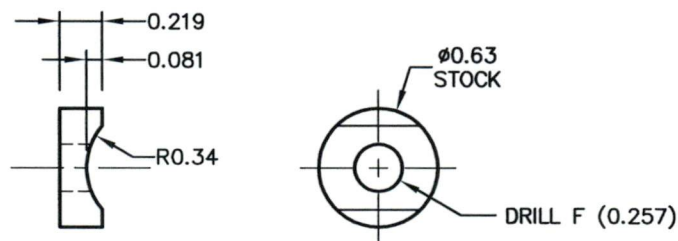
		95226-01	01	CRESCENT BUSHING	6061-T6 ALUMINUM	QQ-A-200/8	#0.75 ROD				
01	PART NO.	ITEM	DESCRIPTION		MATERIAL	MATERIAL SPEC	STOCK SIZE				
QTY	LIST OF MATERIALS										
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				CHECKED: E. BURGAIN							
				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1				BELL 206B, 206L SERIES, 407 CYCLIC FRICTION LOCK PARTS - CRESCENT BUSHING			
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NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.



01 CURVED WASHER

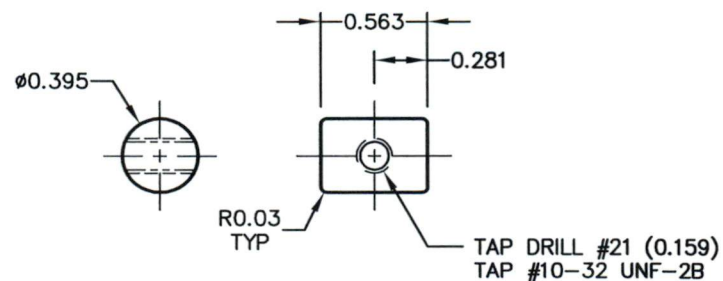
	95228-01	01	CURVED WASHER	DELTRIN (BLACK)	COMMERCIAL	Ø0.625 ROD	
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE	
QTY	LIST OF MATERIALS						
			APPROVALS	DATE	AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 www.aerodesign.ca		
			DRAWN: JEFF CLARKE	18 OCT 2012			
			CHECKED: E. BURGON				
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SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.			
SHEET 1 OF 1		A4	95228	0			

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE	*	*

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.



(01) BARREL NUT

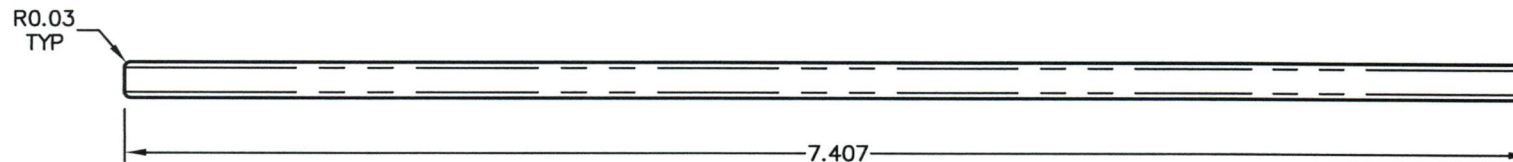
		95230-01		01	BARREL NUT		NYLON 101 PA66		COMMERCIAL		Ø0.5 ROD	
01	PART NO.		ITEM	DESCRIPTION			MATERIAL		MATERIAL SPEC		STOCK SIZE	
QTY		LIST OF MATERIALS										
					APPROVALS		DATE		AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-9027 fax: (403) 250-6333 www.aerodesign.ca			
					DRAWN: JEFF CLARKE		18 OCT 2012					
					CHECKED: E. BURGOIN							
					UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1				BELL 206B, 206L SERIES, 407 CYCLIC FRICTION LOCK PARTS - BARREL NUT			
SCALE 1 : 1		DWG. SIZE		DWG. NO.		REV.						
SHEET 1 OF 1		A4		95230		0						

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE	*	*

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.

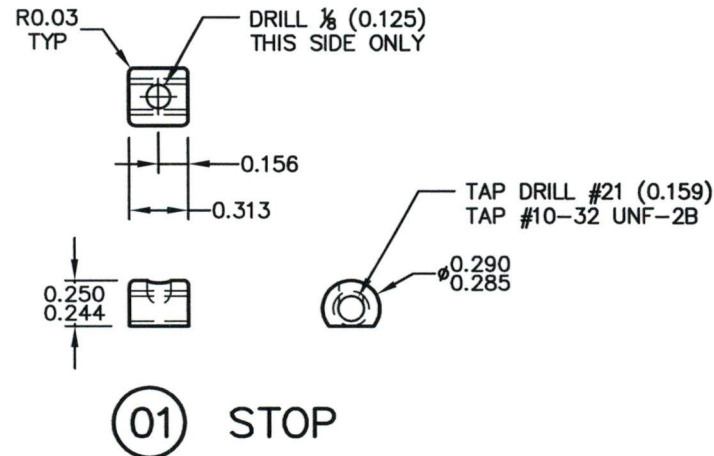


01 THREADED ROD

	95232-01	01	THREADED ROD	304 STAINLESS STEEL	ASTM F593	#10-32 THREADED ROD
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					
			APPROVALS	DATE	AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-9087 fax: (403) 250-8333 www.aerodesign.ca	
			DRAWN: JEFF CLARKE	18 OCT 2012		
			CHECKED: E. BURGAIN			
			UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1		BELL 206B, 206L SERIES, 407 CYCLIC FRICTION LOCK PARTS - THREADED ROD	
SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.		
SHEET 1 OF 1		A4	95232	0		

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0	INITIAL ISSUE	*	*



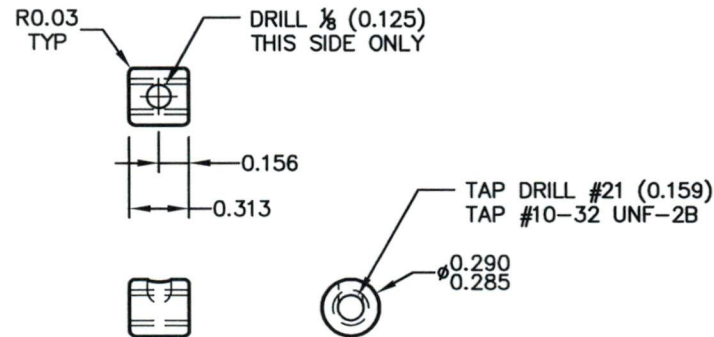
NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.

		95234-01		01	STOP		304 STAINLESS STEEL		ASTM A479		Ø0.313 ROD	
01	PART NO.		ITEM	DESCRIPTION			MATERIAL		MATERIAL SPEC		STOCK SIZE	
QTY		LIST OF MATERIALS										
					APPROVALS		DATE		AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-9087 fax: (403) 250-8333 www.aerodesign.ca			
					DRAWN: JEFF CLARKE		18 OCT 2012					
					CHECKED: E. BURGAIN							
					UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1				BELL 206B, 206L SERIES, 407 CYCLIC FRICTION LOCK PARTS - STOP			
				SCALE 1 : 1		DWG. SIZE		DWG. NO.		REV.		
				SHEET 1 OF 1		A4		95234		0		

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0	INITIAL ISSUE	*	*



01 STOP

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.

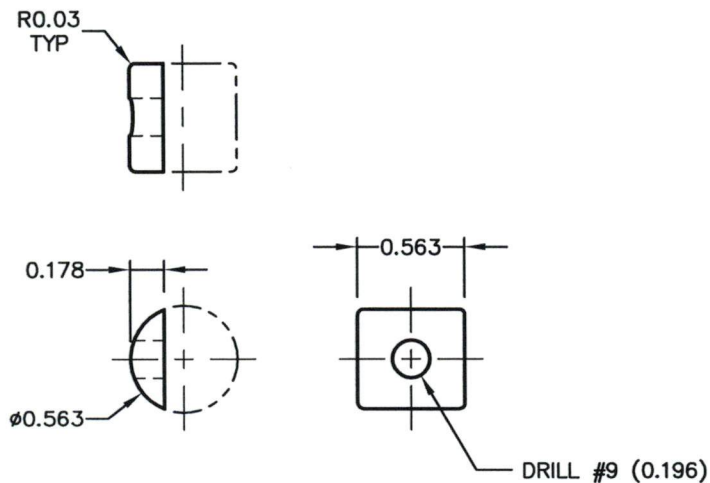
	95236-01	01	STOP	304 STAINLESS STEEL	ASTM A479	Ø0.313 ROD
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					
				APPROVALS	DATE	AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-9087 fax: (403) 250-6333 www.aerodesign.ca
				DRAWN: JEFF CLARKE	18 OCT 2012	
				CHECKED: E. BURGAIN		
				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		BELL 206B, 206L SERIES, 407 CYCLIC FRICTION LOCK PARTS - STOP
				SCALE 1 : 1	DWG. SIZE	DWG. NO.
				SHEET 1 OF 1	A4	95236
						0

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0	INITIAL ISSUE	*	*

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.

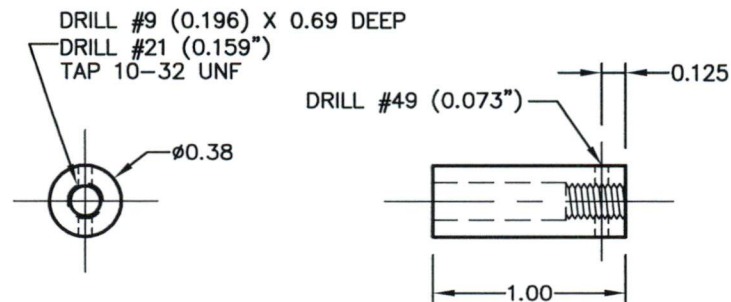


01 CURVED WASHER

95238-01		01	CURVED WASHER	6061-T6 ALUMINUM	QQ-A-200/8	Ø0.625 ROD	
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE	
QTY	LIST OF MATERIALS						
			APPROVALS	DATE	AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-0027 fax: (403) 250-0333 www.aerodesign.ca		
			DRAWN: JEFF CLARKE	18 OCT 2012			
			CHECKED: E. BURGOIN				
			UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1		BELL 206B, 206L SERIES, 407 CYCLIC FRICTION LOCK PARTS - CURVED WASHER		
SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.			
SHEET 1 OF 1		A4	95238	0			

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0	INITIAL ISSUE	*	*



01 TOOL

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.

	95290-01	01	TOOL	BRASS	COMMERCIAL	0.375 ROD
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					
				APPROVALS	DATE	AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8087 fax: (403) 250-8333 www.aerodesign.ca
				DRAWN: JEFF CLARKE	18 OCT 2012	
				CHECKED: E. BURGON		
				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1		BELL 206B, 206L SERIES, 407 CYCLIC FRICTION LOCK TOOL - THREADED ROD
				SCALE 1 : 1	DWG. SIZE	DWG. NO.
				SHEET 1 OF 1	A4	95230
						0

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 527

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Cyclic Friction Replacement on Bell 206B, 206L Series, 407
Certification Basis of design change and revision date:	FAR 27, Amendment 27-30
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 952.90)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 95201

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 206L/407 Maintenance Manuals, BHT-206B-MM/BHT-206L-MM/BHT-407-MM	Supplemental ICA ref: Single Manual (ICA952.90)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 206B/206L/407 Maintenance Manuals	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-1
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-5

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: Section 67-4
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 27/67	Supplemental ICA ref: Section 67-1 thru 67-3
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: N/A
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 206B/206L/407 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: N/A
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: N/A
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A527.4 AWL - Separate Section 1

The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 527.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."

ICA ref: Bell 206B/206L/407
Maintenance Manual, Chapter 4

Supplemental ICA ref: Chapter 4

BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.

Applicants Signature:  Date: 31 October, 2012

Applicants Name: E. Burgoin, P.Eng, DAR 290M

BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.

Reviewer's Name: _____ Phone # _____ Email: _____ Mail Routing Symbol: _____

Signature: _____ Date: _____ NAPA Number _____

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 952.90{~~PRIVATE~~}

CYCLIC FRICTION REPLACEMENT

Bell 206B, 206L Series, 407

Preface

These Instructions for Continued Airworthiness shall be included in the Bell 206B, 206L Series, and/or 407 Maintenance Manual when the Cyclic Friction Replacement is installed in accordance with AERO Design Ltd. Document Control List DCL952, Revision 0, or later approved revision.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0
Date: 25 October 2012

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
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E-Mail: info@aerodesign.ca

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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0			Original Issue

LIST OF EFFECTIVE PAGES

List of Revisions

Revision 0 (Original Issue)

25 October 2012

List of Effective Pages

<u>Title</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	0
Revision Record/List of Effective Pages	2	0
Table of Contents	3	0
00-00-00	4-5	0
04-00-00	6	0
05-00-00	7	0
67-00-00	8-10	0

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0-3 DISTRIBUTION	4
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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 27.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Cyclic Friction Replacement as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness
LH - Left Hand
RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Cyclic Friction Replacement. Requests for a copy may be made in writing to:

AERO Design Ltd.
2013 39th Avenue N.E.
Calgary, Alberta
T2E 6R7
Fax: 403-250-8333
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

Bell 206B helicopters serial numbers 1 through 1657 use a different clamping arrangement for the cyclic friction and are not eligible for this installation.

0-5 GENERAL DESCRIPTION

The cyclic stick control on light Bell helicopters has an adjustable friction device built into the base of the cyclic stick pivot. Two adjustments can be made: a) minimum friction, which is set by the AME, and b) additional friction which can be set by the pilot to suit his preference.

The original design provided by Bell uses different thread pitches on the cyclic friction shaft to provide clamping force on the cyclic stick pivot ball using barrel nuts. Minimum friction is set by the AME at the time of installation and checked periodically with the inspection schedule for the helicopter. There is no way to limit the tightening force that can be applied by the pilot. Excessive tightening causes significant wear on the threads on the shaft and in the barrel nuts.

The new cyclic friction replacement part allows for the minimum friction to be set in exactly the same manner as the original configuration. The additional cyclic friction, applied at the pilot's discretion, is provided by a cam action lever. The cam action provides the mechanical advantage needed to close the gap in the clamp around the cyclic stick pivot ball. Experience with the cam lever arrangement in similar applications shows wear on the mating surfaces is not a significant issue, which will extend the service life of the new part over the original.

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

No additional airworthiness limitations have been imposed due the installation of the Cyclic Friction Replacement.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Inspections are to be carried out in accordance with the schedule and procedures in the existing Maintenance Manual as applicable to the model of helicopter, or other approved program.

Refer to Maintenance Manual, Chapter 5, as follows:

206B: BHT-206A/B-MM-1

206L: BHT-206L-MM-1

206L-1: BHT-206L1-MM-1

206L-3: BHT-206L3-MM-1

206L-4: BHT-206L3-MM-1

407: BHT-407-MM-1

CHAPTER 67 – FLIGHT CONTROLS

67-1 CYCLIC FRICTION REMOVAL

Removal instructions are applicable if the cyclic friction is removed by itself or as part of removing the entire cyclic stick assembly. Refer to Maintenance Manual Chapter 27 (Bell 206L and 260L-1) or Chapter 67 (Bell 206B, 206L-3, 206L-4, 407) for removal instructions of the cyclic stick assembly.

Refer to figure 67.1

1. Remove pilot seat. Refer to Maintenance Manual Chapter 25.
2. Remove pilot seat panel.
3. Place cyclic friction lever in OPEN position (straight out).
4. Remove cotter pin (7), nut (6), washers (04/05), and curved washer (03) from end of cyclic friction.
5. Slide cyclic friction assembly out of cyclic pivot support assembly and out of cyclic stick boot.

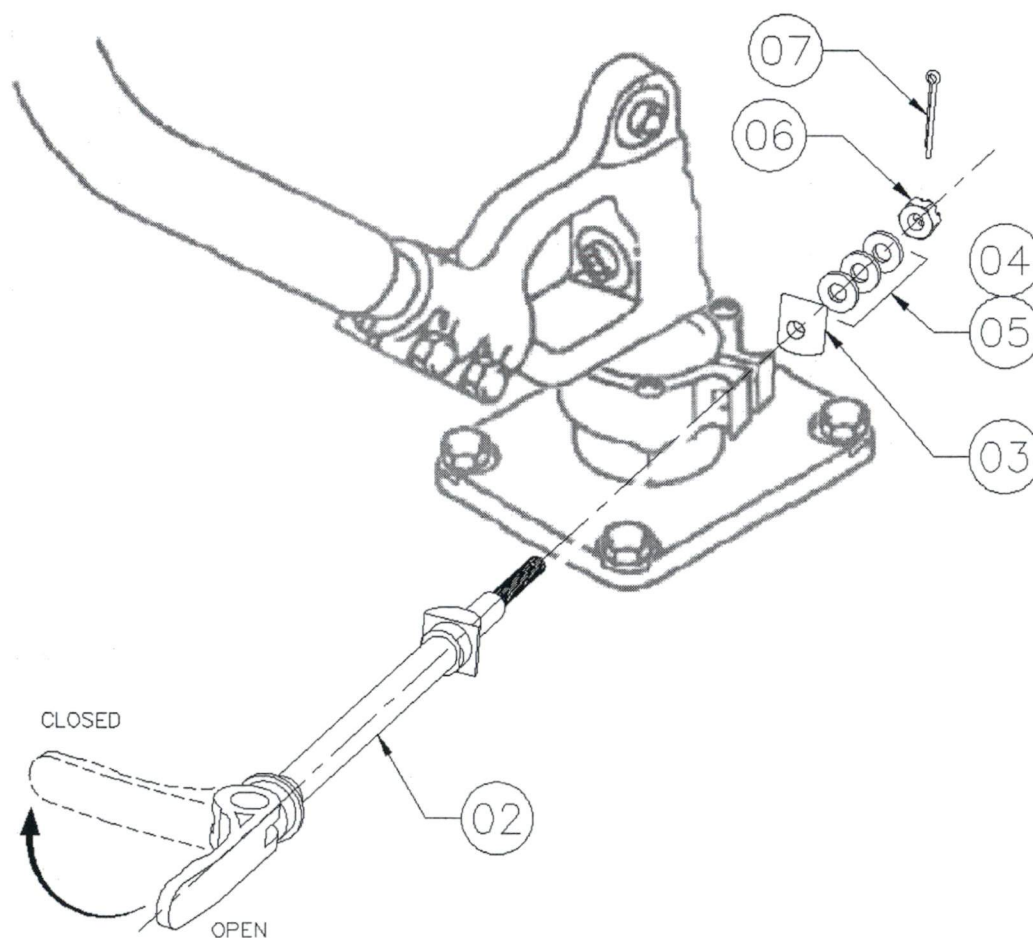


Figure 67.1 – Cyclic Friction Assembly

67-2 CYCLIC FRICTION INSTALLATION

Refer to figure 67.1

1. Remove pilot seat. Refer to Maintenance Manual Chapter 25.
2. Remove pilot seat panel.
3. Slide cyclic friction assembly (02) into cyclic stick boot, seat curved end into cyclic pivot support assembly.
4. Slide curved washer (03) onto threaded end of cyclic friction assembly.
5. Slide NAS1149F0363 (04) and/or NAS1149F0332 (05) washers (as required) onto threaded end of cyclic friction assembly.
6. Thread AN310-3 castellated nut (06) onto threaded end of cyclic friction assembly. Do not tighten.
7. Set minimum friction in accordance with Section 67-3 (below).
8. Safety the AN310-3 castellated nut with MS24665-153 cotter pin (07) in accordance with AC43.13-1B, section 7-127, in the minimum friction position.
9. Install pilot seat panel and pilot seat. Refer to Maintenance Manual Chapter 25.

67-3 CYCLIC FRICTION ADJUSTMENT - MINIMUM FRICTION

1. Set minimum friction with cam lever in OPEN position (straight out) and loose in accordance with the maintenance manual:
 - 206B: BHT-206A/B-MM-8, Section 67-39
 - 206L: BHT-206L-MM-1, Section 27-27A
 - 206L-1: BHT-206L1-MM-1, Section 27-28
 - 206L-3: BHT-206L3-MM-8, Section 67-40
 - 206L-4: BHT-206L3-MM-8, Section 67-40
 - 407: BHT-407-MM-8, Section 67-56

67-4 OPERATING INFORMATION

The pilot may increase friction beyond the minimum as set by rotating the cam lever to the closed position.

To adjust the amount of friction provided by the cam action above the minimum friction:

1. Set cam lever to OPEN position (straight out).
2. Turn lever clockwise to increase friction, counter-clockwise to reduce friction
3. Rotate cam lever to CLOSED position (perpendicular to shaft) to check friction.

CAUTION

If the cam lever in the CLOSED position points between the 9 o'clock and 12 o'clock position when looking aft (see figure 67.2), the cam lever may interfere with full motion of the cyclic stick. Do not set cyclic friction cam lever in this area.

Avoid setting in
9-12 position
as shown.

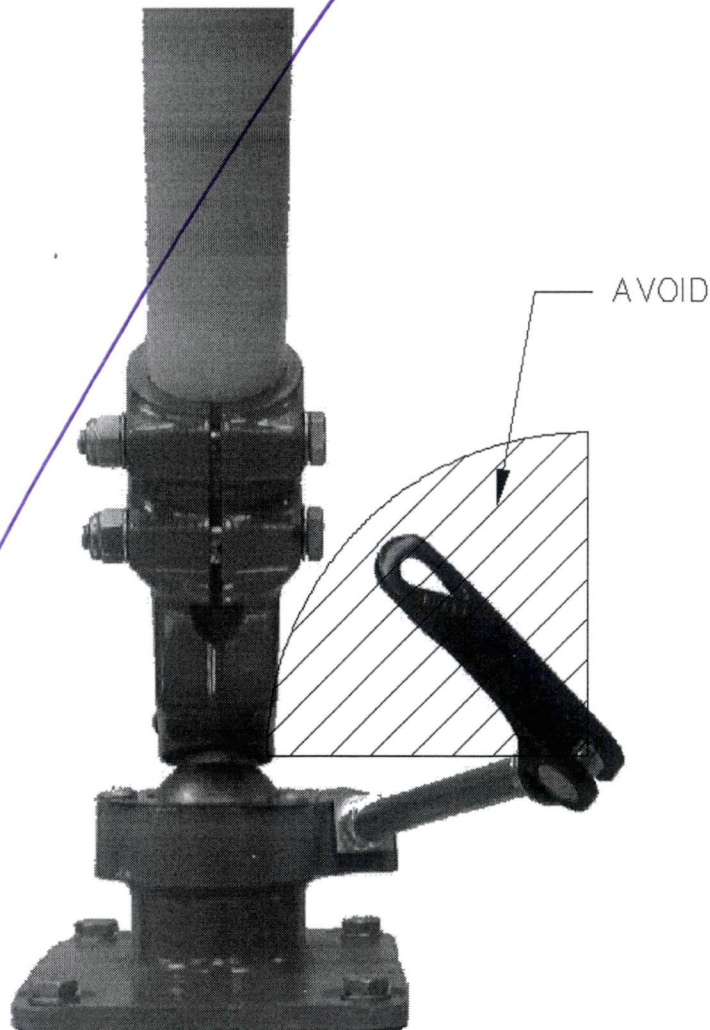


Figure 67.2 – Cam Lever Avoid Region
(Looking aft)

67-4 OPERATING INFORMATION

The pilot may increase friction beyond the minimum as set by rotating the cam lever to the closed position.

To adjust the amount of friction provided by the cam action above the minimum friction:

1. Set cam lever to OPEN position (straight out).
2. Turn lever clockwise to increase friction, counter-clockwise to reduce friction
3. Rotate cam lever to CLOSED position (perpendicular to shaft) to check friction.

CAUTION

Avoid setting the cam lever where the CLOSED position points between the 9 o'clock and 12 o'clock position when looking aft, see figure 67.2.

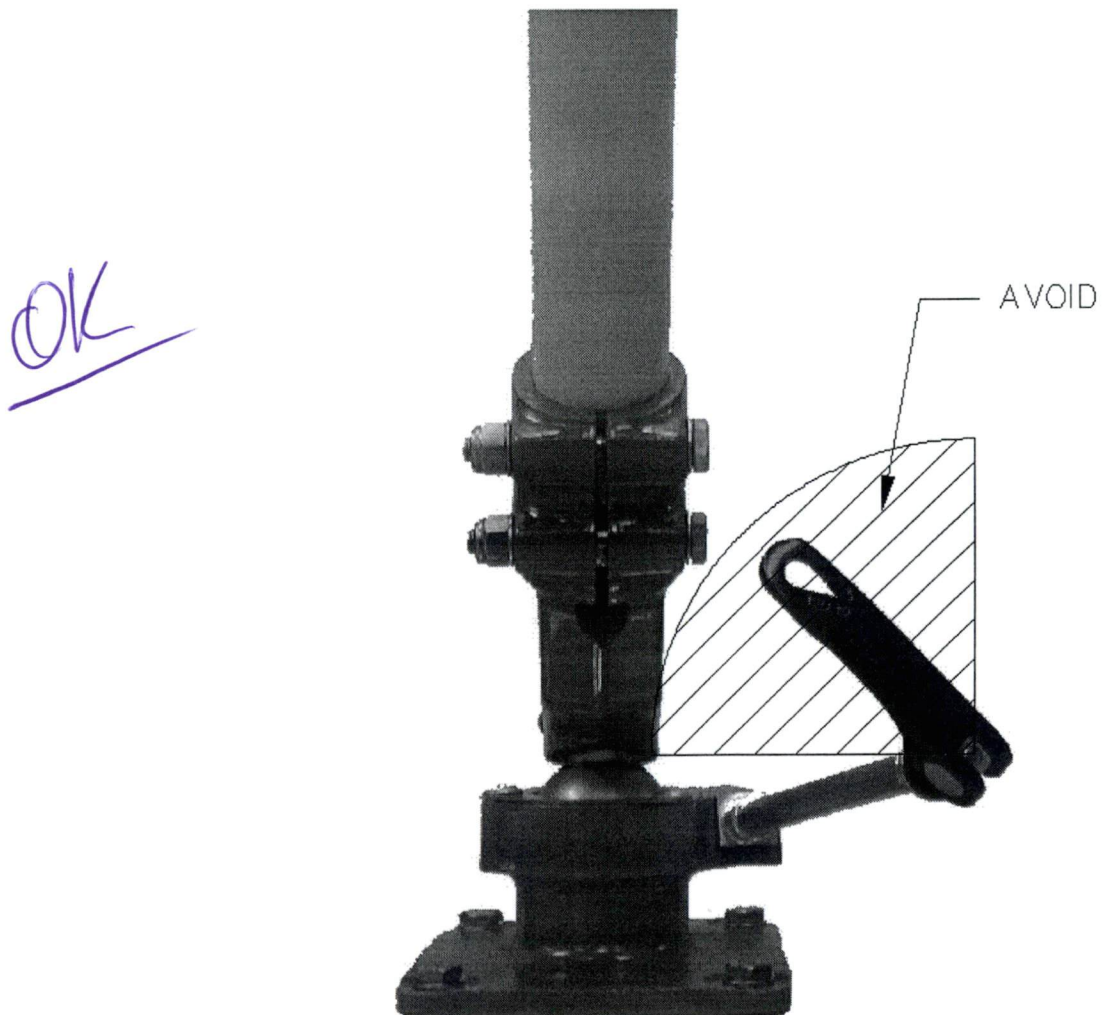


Figure 67.2 – Cam Lever Avoid Region
(Looking aft)

AERO Design Ltd.

ENGINEERING REPORT

ER952.01

BELL HELICOPTER

MODELS 206B, 206L, 206L-1, 206L3, 206L-4 AND 407

REPLACEMENT CYCLIC STICK FRICTION

Approved by: E. Burgoin, DAR 290M

Revision 0, 25 October 2012

AERO Design Ltd.
Engineering Consultants
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2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
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1.0 INTRODUCTION

The cyclic stick control on light Bell helicopters has an adjustable friction device built into the base of the cyclic stick pivot. Two adjustments can be made: a) minimum friction, which is set by the AME, and b) additional friction which can be set by the pilot to suit his preference.

The minimum friction is applied and adjusted by tightening a castellated nut on the end of the cyclic friction shaft in accordance with instructions found in the Bell Maintenance Manual and secured with a cotter pin. This adjustment is made by removing the pilot's seat and seat panel and is not accessible except when opened up for maintenance activities.

The additional friction applied at the pilot's discretion, is provided by rotating the cyclic friction shaft which projects out from under the pilot's seat. The shaft has two (2) sections of thread: one section is a 5/16-24 UNF thread and the other section is a 1/4-20 UNC thread. Each section of threaded shaft is fitted onto its own barrel nut which spans a gap in the clamp which tightens Cyclic Stick Pivot ball. As the shaft is rotated, the distance between the barrel nuts increases/decreases due to the differential between the two thread pitches causing a clamping action with considerable mechanical advantage. A knob (approx. 1.5 in. dia.) is fitted to end of the shaft protruding forward from under the pilot's seat allowing the pilot to make adjustments while seated.

The Bell Flight Manuals do not provide any guidance as to what the additional friction provided by the pilot is suppose to do or how to operate the control except to say: "Tighten friction as desired". In practice, the cyclic friction is tightened up to hold the cyclic control when the pilot exits the helicopter while the main rotor is still turning. This may be when the rotor is spooling down after the engine has been shut down or in some cases with the engine running (pilot only hot refueling)

When required, to ensure that there is no movement of the stick, pilot's torque up the cyclic stick friction as hard as they can with the size of the knob provided. The result is severe wear on the shaft threads and associated barrel nuts. It is common to replace these components every season and in the extreme they may be replaced several times during a season.

A new cyclic friction device has been designed to eliminate the wear issues found in the Bell parts and the resulting costly annual maintenance.

The minimum cyclic friction is set by the AME in a manner which is exactly identical to the existing Bell components: a castellated nut and cotter pin onto the end of the shaft. All of the instructions in the Bell maintenance manual related to setting minimum friction are applicable.

The additional cyclic friction, applied at the pilot's discretion, is provided by a cam action similar to that used on a quick-release bicycle hub. The cam action provides the mechanical advantage needed to close the gap in the clamp around the Cyclic Stick Pivot ball. Cam-action quick-release bicycle hubs have been used on racing bikes for over sixty years. Experience has demonstrated them to be reliable and not subject to excessive wear.

2.0 REFERENCE TEXT

Aero Design Ltd. Installation drawing 95201 and subsequent
Bell 206B Maintenance Manual
Bell 206B Flight Manual
Bell 206L, L1, L3 and L4 Maintenance Manuals
Bell 206L, L1, L3 and L4 Flight Manuals
Bell 407 Maintenance Manual
Bell 407 Flight Manual

3.0 BASIS OF CERTIFICATION

206, 206A, 206A-1, 206B, 206B-1, 206L and 206L-1

CAR 6 dated December 20, 1956, Amendments 6-1 thru 6-4, CAR 6.307(b) and 6.637 of Amendment 6-5, Special Conditions dated October 2, 1962, as revised February 8, 1966, plus the water/alcohol power augmentation special conditions dated November 14, 1967, revised September 15, 1975. Special Conditions for "IFR Instrument Flight requirements for Bell Model 206B/L" submitted to Bell by FAA (ASW-216) letter dated July 16, 1975.

Exemption No. 595 for Model 206A only.

Exemption No. 595A for Model 206A-1 only.

Exemption. 595B for Model 206B and 206B-1 only.

206L-3

For 206L-3 the basis of certification is the same as above plus FAR 27.1529 at amendment 18.

206B S/N 5101 through 5400

The Basis of Certification is same as 206B above plus:

Model 206B S/N 5101 through 5400, meets fuel system qualifications to NPRM 90-24. "Crash resistant fuel systems in normal and transport category rotorcraft", Draft paragraph 29-952 and associated revised paragraphs refer.

206L-4

For Model 206L-4 FAR Part 27 dated 2 October 1964 Amendment 27-1 thru 27-24 with: 27.45, 27.141, 27.1309 at Amdt 27-20; 27.1093, 27.1545 at Amdt 27-8; 27.79, 27.143, 27.173, 27.175, 27.1519, 27.1585, 27.1587 at Amdt 27-1; 27.2, 27.307, 27.337, 27.351, 27.427, 27.501, 27.571, 27.613, 27.629, 27.663, 27.674, 27.685, 27.727, 27.783, 27.807, 27.861, 27.865 at Amdt 27-28; and 27.391, 27.395, 27.397, 27.681, 27.1357, 27.1361, replaced by 6.220, 6.225, 6.323, 6.623, 6.624, 6.625, 6.626 of CAR Part 6 dated 6 December 1956

Amendment 6-1 thru 6-4.

Exceptions to FAR 27 are the deletion of: 27.71, 27.177, 27.399, 27.562, 27.610, 27.954, 27.1195, 27.1322.

Equivalent Safety Findings: 1. Skid Landing Gear (Drop Test) - FAR 27.723, 27.725, and 27.727; 2. Fuel Tanks (Drop Test) - FAR 27.965(c)(1) and (c)(2). FAR Part 36 dated 3 November 1969 Amendment 36-1 thru 36-14, Subpart H

407

- 1) FAR part 27, dated October 2, 1964 Amendment 27-1 through 27-30
Paragraph 27.561(b)(3) at Amdt 27-24;
Section 27.563 at Amdt. 27-25;
Section 27.785 at Amdt 27-24;
Section 27.1093 at amendment 27-8; and
Section 27.173 at amendment 27-1.
Section 27.175 at amendment 27-1
Exemptions to FAR 27 are the deletion of sections: 27.562, 27.1195, and 27.952(b)(1)
- 2) FAR 36 Amdt. 36-1 through 36-20, and Chapter 516 of Transport Canada Airworthiness Manual which is the same as ICAO Annex 16 (Chapter II, dated March 1993).
- 3) Plus the following sections of Canadian Airworthiness Manual, Change 527-3 dated January 3, 1994;

527.1093(b)(i)(ii), & (iii)	Induction System Icing Protection
527.1301-1	Rotorcraft Operations After Ground Cold Soak
527.1557(c)(3)	Miscellaneous Markings and Placards
527.1581(e)	Rotorcraft Flight Manual
527.1583(h)	Operating Limitations
- 4) Transport Canada Special Conditions
High Intensity Radiated Fields (HIRF), SCA 95-02, April 26, 1995 Lighting Protection, SCA 95-03, April 26, 1995
- 5) Equivalent Safety Findings exist with respect to the following regulations:

-FAR 27.307(b)(5), 27.723, 27.725,	
and 27.727	Skid Type Undercarriages
-FAR 27.952	Forward Fuel Tank Drop Test
-FAR 27.952	Aft Fuel Tank Drop Test
-FAR 27.965(c)(1) and (2)	Fuel Tank Pressure Test
-FAR 27.1305(p)	Engine Anti-Ice Annunciation

4.0 APPLICABILITY OF AIRWORTHINESS DIRECTIVES

Airworthiness Directives applicable to the -
were reviewed, and none were found to affect this project.

5.0 COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 - 39th Ave N.E.
Calgary, Alberta, T2E 6R7

ORIGINAL DATE: 24 October 2012

CP952

REVISION No. 0

MAKE: Bell

MODEL: 206B, 206L Series, 407

CORRESPONDANCE TO: AERO Design Ltd.

(If other than applicant) 2013 - 39th Ave N.E.

Calgary, Alberta, T2E 6R7

REGISTRATION: All eligible

SERIAL No.: All eligible

NATURE OF WORK: Cyclic Stick Control Friction

TYPE CERTIFICATE DATA SHEET: H-92

MODEL CERTIFICATION BASIS: FAR Part 27, dated 2 October 1964, including amendments 27-1 through 27-30 except as noted (Bell 407)

MODIFICATION CERTIFICATION BASIS: FAR Part 27, dated 2 October 1964, including amendments 27-1 through 27-30 except as noted (Bell 407)

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart B - Flight					
27.29	Empty weight and corresponding C of G	N/A			No change from Type Approved configuration
Subpart D - Design and Construction					
27.601	Design	Use of conventional design		X	
27.603	Materials			X	
27.605(a)	Fabrication Methods			X	
27.607(b)	Fasteners			X	
27.609	Protection of Structure			X	
27.611	Inspection Provisions	No change from Type Approved configuration		X	
27.777	Cockpit Controls	Statement in Report			**

Subpart G - Operating Limitations and Information

27.1529	Instructions for Continued Airworthiness	ICA provided	X
27.1581	Rotorcraft Flight Manual - General	FMS provided	X
27.1585	Operating Procedures	FMS provided	X

Instructions provided in the existing Flight Manual are applicable without change. Additional instructions on use of friction are provided.

6.0 COMPLIANCE WITH FAR 27.777 COCKPIT CONTROLS

Cockpit controls must be--

- (a) Located to provide convenient operation and to prevent confusion and inadvertent operation; and
- (b) Located and arranged with respect to the pilots' seats so that there is full and unrestricted movement of each control without interference from the cockpit structure or the pilot's clothing when pilots from 5'2" to 6'0" in height are seated.

The Cyclic Friction Replacement control is located in the identical location as the Type Approved cyclic friction supplied by Bell Helicopter. Located under the pilot's left leg, protruding forward from out under the pilot's seat, it is similarly convenient for the pilot to reach and operate as the Type Approved configuration. There are no other controls located close to this location to cause confusion.

The Cyclic Friction Replacement control can be operated without interference with cockpit structure and is so located such that it is free from contact with the pilot's clothing.

7.0 COMPLIANCE WITH FAR27.769 CONTROL SYSTEM LOCKS

Control system locks.

If there is a device to lock the control system with the rotorcraft on the ground or water, there must be means to--

- (a) Give unmistakable warning to the pilot when the lock is engaged; and
- (b) Prevent the lock from engaging in flight.

Compliance with FAR27.769 was carefully considered during design as to whether the cyclic stick friction is a control lock or not. It was considered that the device is a cyclic stick friction device and not a control lock and that this is how it was considered during original Type Design and certification. If considered a control lock, then the Type Approved configuration is non-compliant with 27.769(a).

The Cyclic Stick Replacement is no different than the Type Approved Bell configuration with respect to this paragraph.

AERO DESIGN LTD.
2013 - 39 Avenue N.E.
Calgary, Alberta, T2E 6R7

SIGNED UNDERTAKING

Tel: 403-250-8027
Fax: 403-250-8333

A In accordance with CAR 521 AERO Design Ltd. hereby
Company to hold the approval document(s):
undertake to carry out the responsibilities of a design approval document holder,
as set out in Division VIII of Part V, Subpart 21 of the CARs, regarding:

1. Technical capability,
2. Service difficulty reporting,
3. Establishing a service difficult reporting system,
4. Investigation of service difficulty reports,
5. Mandatory changes,
6. Transfers,
7. Record keeping and loss or disposal of records,
8. Manuals,
9. Instructions for continued airworthiness, and
10. Supplemental integrity instructions

The responsibilities noted above are with reference to the data which may be found with one or more of the following numbers:

Transport Canada file number: 6-12-0917

and / or

Project Reference number: 952

and / or

Approval Number: _____

X

Signature of Holder's authorized person:

24 October 2012

Date:

President

Position / Title:

B Pursuant to the requirements of the CARs, Part V, Subpart 521, Chapter 160:
AERO Design Ltd. agrees to administer the preceding responsibilities on
behalf of the holder of the approval(s) below, on a fee for service basis.

per: _____
Signature

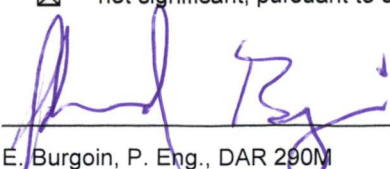
X _____
Signature of Holder's authorized person:

Print Name Title

Print Name

Date:

Date

CHANGED PRODUCT RULE (CPR) DECISION RECORD	
NAPA No.:	
Step 1: Identify the proposed change to the aeronautical product. (Section 4.1 of AC 500-016)	The changes are as previously described.
Step 2: Is the change substantial? (Section 4.2 of AC 500-016)	<input type="checkbox"/> Yes A new type certificate is required. CPR Decision Process is Closed . <input checked="" type="checkbox"/> No Proceed to Step 3
Step 3: Will the latest standards be used? (Section 4.3 of AC 500-016)	<input type="checkbox"/> Yes Certification basis to use latest standards. CPR Decision Process is Closed . <input checked="" type="checkbox"/> No Proceed to Step 4.
Step 4: Is the proposed change significant? (Section 4.4 of AC 500-016)	<input type="checkbox"/> Yes Proceed to Decision. <input checked="" type="checkbox"/> No Compliance may be shown to earlier standards. Certification basis to be defined and documented as indicated (below). CPR Decision Process is Closed .
Decision: Will the latest standards be used?	<input type="checkbox"/> Yes Certification basis to use latest standards. CPR Decision Process is Closed . <input type="checkbox"/> No Proceed to Step 5, addressing each area separately (see below).
Identification of Affected Areas:	The area(s) affected by the proposed change have been detailed in Compliance Program: CP952
Note: A delegate may develop a proposal for the Yes/No decision of Step 6, however, TCCA will make the final determination.	
Area:	
Step 5: Is this area affected by the proposed change? (Section 6.1 of AC 500-016)	<input type="checkbox"/> Yes Proceed to Step 6. <input type="checkbox"/> No Compliance with the latest standards is not required. Compliance may be shown to earlier standards. Certification basis defined or documented as indicated below.
Step 6: Are the latest standards practical and do they contribute materially to the level of safety? (Section 6.2 of AC 500-016)	<input type="checkbox"/> Yes Certification basis to be established using latest standards. <input type="checkbox"/> No Compliance with the latest standards is not required. Compliance may be shown to earlier standards. Certification Basis defined or documented as indicated in below.
<input type="checkbox"/> Continuation Sheet(s) Attached	Note: Several standards may apply to each area and the assessment may differ from standard to standard. Indicate Yes if compliance with any latest standard(s) will be required. Indicate No only if no later standards are to be applied.
Certification Basis	The certification basis is as follows or as detailed in the listed document(s): Bell 206B, 206L Series, 407; TCDS H-92: FAR part 27, dated October 2, 1964 Amendment 27-1 through 27-30, with exceptions as noted
Under the delegated authority, I have examined the change in type design listed above according to established procedures and hereby determine, to the best of my knowledge and belief, that it is. (check one) <input type="checkbox"/> substantial, pursuant to subsection 511.14 or 513.14 of the CARs <input type="checkbox"/> significant, pursuant to subsection 511.13(3) or 513.07(3) of the CARs <input checked="" type="checkbox"/> not significant, pursuant to subsection 511.13(3) or 513.07(3) of the CARs	
 E. Burgoin, P. Eng., DAR 290M	24 October, 2012 Date

Title: Bell 206/407 Cyclic Stick Friction

Approval: STC

Manufacture: Mfd by Aero Design (amend Approved Product List)

Customer:

Type and Model: Bell 206B, 206L series, 407

Definition Of Change:

Description:

The cyclic stick control on light Bell helicopters has an adjustable friction device built into the base of the cyclic stick pivot. Two adjustments can be made: a) minimum friction, which is set by the AME, and b) additional friction which can be set by the pilot to suit his preference.

The minimum friction is applied and adjusted by tightening a castellated nut (item 10) on the end of the cyclic friction shaft in accordance with instructions found in the Bell Maintenance Manual and secured with a cotter pin. This adjustment is made by removing the pilot's seat and seat panel and is not accessible except when opened up for maintenance activities.

The additional friction applied at the pilot's discretion, is provided by rotating the cyclic friction shaft (item 18) which projects out from under the pilot's seat. The shaft has two (2) sections of thread: one section is a 5/16-24 UNF thread and the other section is a 1/4-20 UNC thread. Each section of threaded shaft is fitted onto its own barrel nut (items 12 and 17) which spans a gap in the clamp which tightens Cyclic Stick Pivot ball. As the shaft is rotated, the distance between the barrel nuts increases/decreases due to the differential between the two thread pitches causing a clamping action with considerable mechanical advantage. A knob (approx. 1.5 in. dia.) is fitted to end of the shaft protruding forward from under the pilot's seat allowing the pilot to make adjustments while seated.

The Bell cyclic stick friction is shown on Fig. 27-8 from the Bell 206L Maintenance Manual, as shown below.

The Bell Flight Manuals do not provide any guidance as to what the additional friction provided by the pilot is suppose to do or how to operate the control except to say: "Tighten friction as desired". In practice, the cyclic friction is tightened up to hold the cyclic control when the pilot exits the helicopter while the main rotor is still turning. This may be when the rotor is spooling down after the engine has been shut down or in some cases with the engine running (pilot only hot refueling)

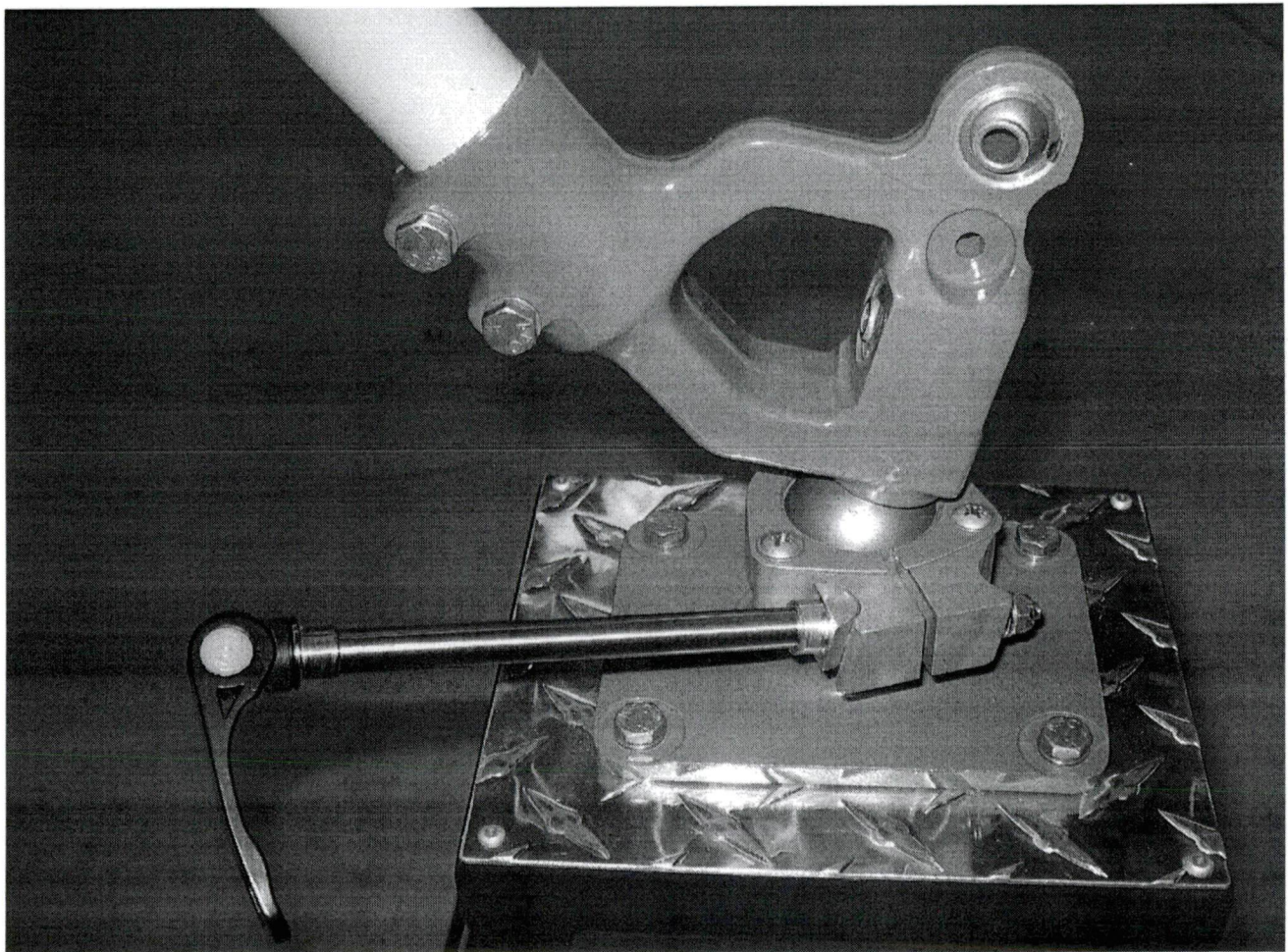
When required, to ensure that there is no movement of the stick, pilot's torque up the cyclic stick friction as hard as they can with the size of the knob provided. The result is severe wear on the shaft threads and associated barrel nuts. It is common to replace

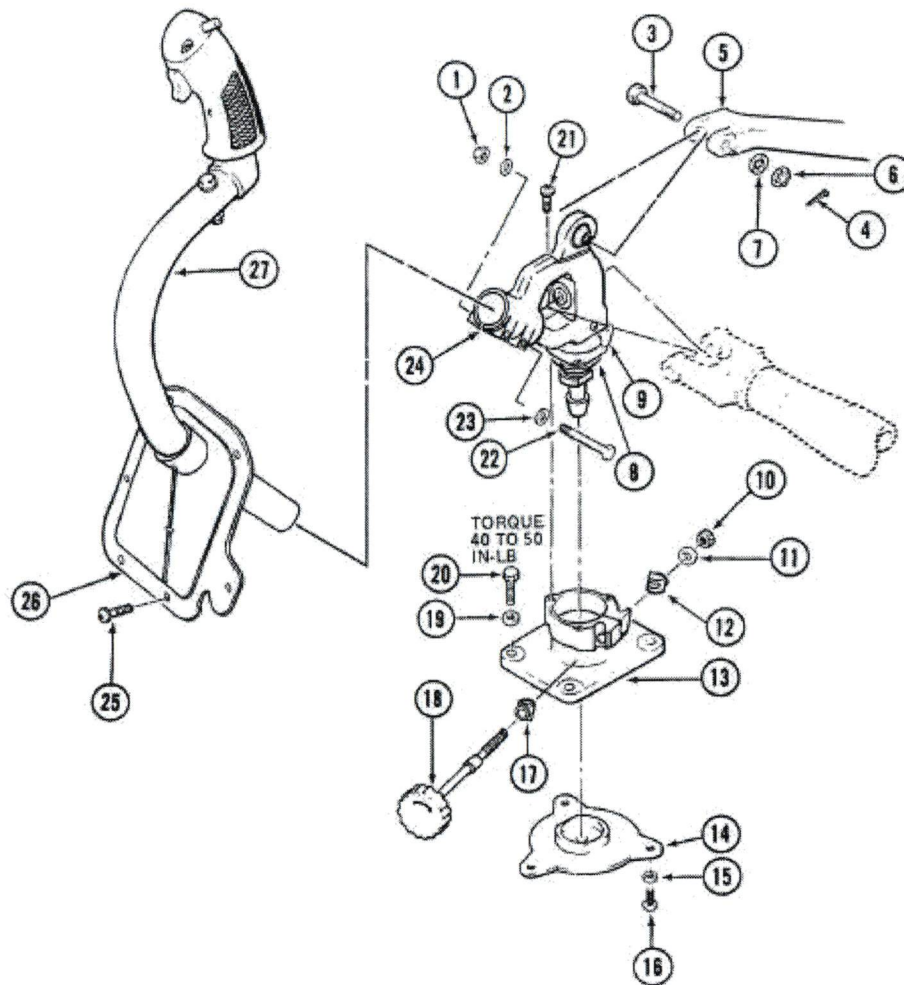
these components every season and in the extreme they may be replaced several times during a season.

A new cyclic friction device has been designed to eliminate the wear issues found in the Bell parts and the resulting costly annual maintenance.

The minimum cyclic friction is set by the AME in a manner which is exactly identical to the existing Bell components: a castellated nut and cotter pin onto the end of the shaft. All of the instructions in the Bell maintenance manual related to setting minimum friction are applicable.

The additional cyclic friction, applied at the pilot's discretion, is provided by a cam action similar to that used on a quick-release bicycle hub. The cam action provides the mechanical advantage needed to close the gap in the clamp around the Cyclic Stick Pivot ball. Cam-action quick-release bicycle hubs have been used on racing bikes for over sixty years. Experience has demonstrated them to be reliable and not subject to excessive wear.





12. Barrel Nut,
13. Pivot Support

17. Barrel Nut
18. Knob and Shaft

10. Nut
11. Aluminum Washer

Figure 27-8. Cyclic stick and torque tube (Sheet 1 of 2)

27-20-00
27-23

Primary Changes to the Aeronautical Product:

Remove existing Bell Cyclic Stick Friction shaft and barrel nuts.

Replace with Aero Design Cyclic Stick Friction design as a direct replacement

Secondary Changes to the Aeronautical Product (Required as consequence of primary changes):

nil

Other Relevant Modifications to the Aeronautical Product (Which impact on this change):

nil

BELL 206B
BELL 206L Series
BELL 407

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT
for the
**INSTALLATION of the AERO DESIGN
CYCLIC FRICTION REPLACEMENT**

Canadian Supplemental Type Certificate No. SH12-XX
FAA Supplemental Type Certificate No. _____

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 206B, 206L Series, or 407 when fitted with the Cyclic Friction Replacement. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	3
V	Weight and Balance	4
VI	Installation / removal instructions	Error! Bookmark not defined.

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	26 Oct 2012	None		

I LIMITATIONS

No change from basic Approved Flight Manual.

II NORMAL PROCEDURES

No change from basic Approved Flight Manual.

Note: Application of additional cyclic friction is achieved by rotating cam lever aft. See section V for further instructions.

III EMERGENCY PROCEDURES

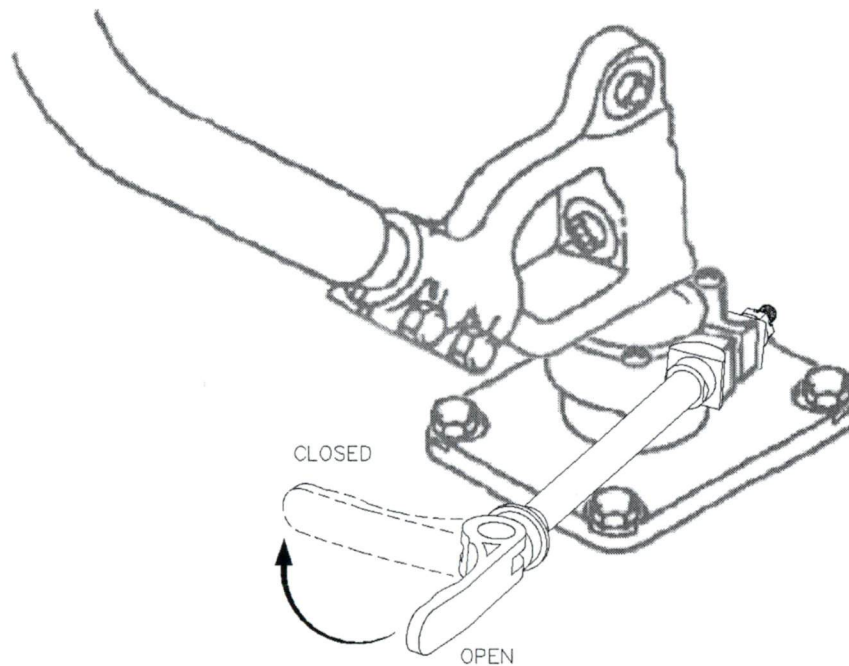
No change from basic Approved Flight Manual.

IV PERFORMANCE

No change from basic Approved Flight Manual.

V OPERATING INFORMATION

The pilot may increase friction beyond the minimum as set by rotating the cam lever to the closed position.



To adjust the amount of friction provided by the cam action above the minimum friction:

1. Set cam lever to OPEN position (straight out).
2. Turn lever clockwise to increase friction, counter-clockwise to reduce friction
3. Rotate cam lever to CLOSED position (perpendicular to shaft) to check friction.

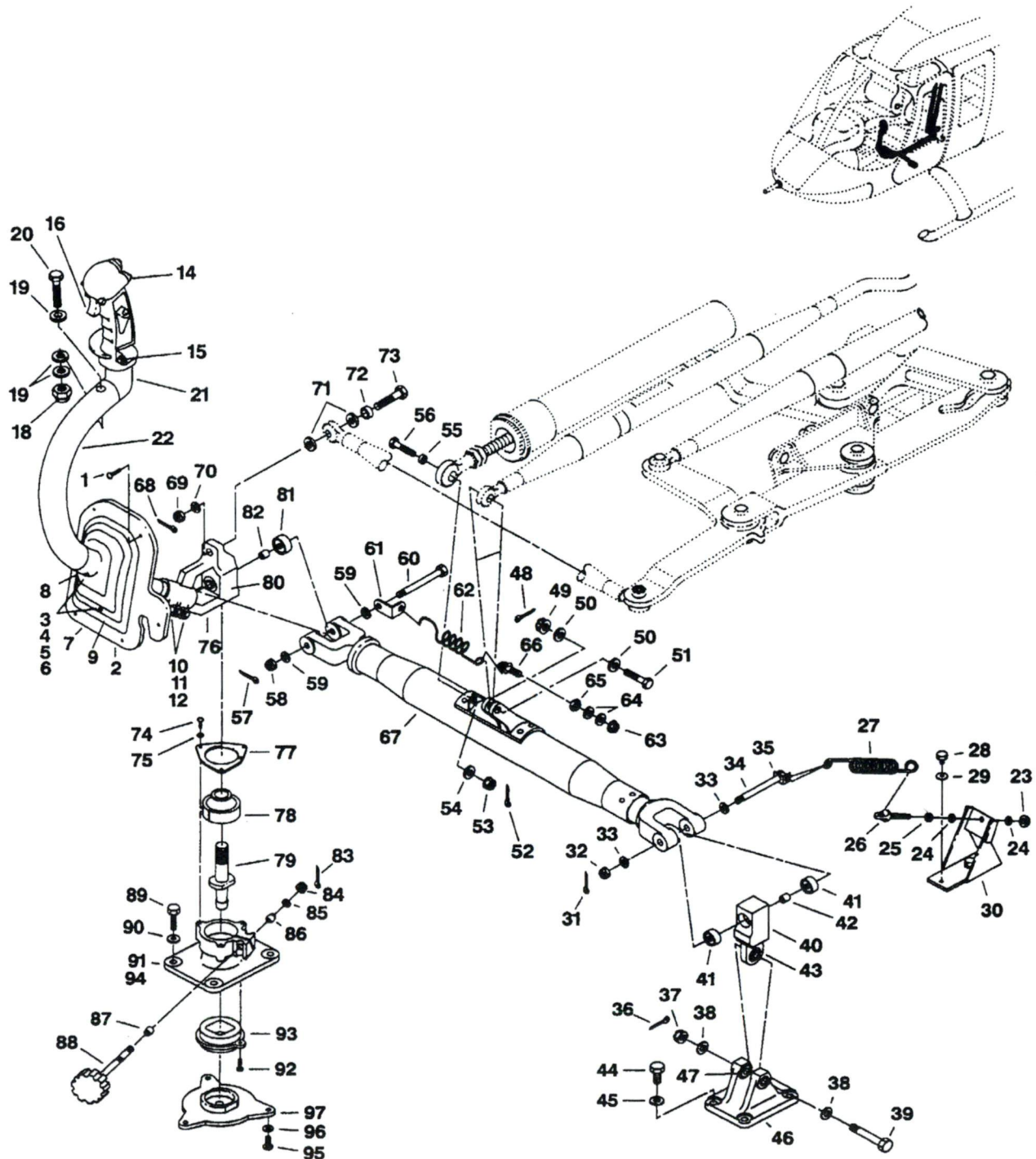
CAUTION

Fracture

If the cam lever points to the upper right (between the 9 o'clock and 12 o'clock position looking aft) when in the CLOSED position, the cam lever may interfere with full motion of the cyclic stick. Do not leave cyclic friction cam lever in this area.

NDWL DOCUMENT UPLOAD CHECK LIST**Not Applicable****Paper****NAPA / NDWL**

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-----------------|
| • Application | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | (project start) |
| • CPR Record | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | (project start) |
| • CP/CCL | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | (project start) |
| • Certificate Holder's Undertaking | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| • Document Control List - DCL (Mod Data Summary) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| • Modification and Repair Order, Engineering Order or
Installation Instructions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| • Flight Manual Supplement - AFMS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| • ICA or Maintenance Manual Supplement (MMS) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| • MSI 53 Checklist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| • Request for extension of delegation (form letter) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| • Substantiation Reports or drawings as required
to support a request for extension of delegation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| • Extension of Delegation (Authority) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| • Copy of Certificate | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | (project end) |
| • Declaration of Conformity | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | (project end) |
| • Statement of Compliance - SOC (AE-100) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | (project end) |
| • Substantiation Reports | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | (project end) |
| • Installation/Assembly/Fabrication Drawings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | (project end) |
| • Others (Reports, Correspondence etc)_____ | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |



407IPB_67000_10080_001_C00

Figure 67-8. Controls installation, cyclic cockpit

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-8. Controls installation, cyclic cockpit			
	407-001-003-103	CONTROLS INSTL, CYCLIC COCKPIT (SEE FIG. 9 FOR BALANCE OF BREAKDOWN)	1	NP	
1	AN525-832R10	.SCREW	6	SP	
2	206-001-361-103	.BOOT ASSY, CYCLIC STICK (S/N 53000, 53001, 53060 . . THRU SUB)	1	SP	
2	206-001-361-045	.BOOT ASSY, CYCLIC STICK (S/N 53002 THRU 53059)	1	SP	
3	AN227-14B	..EYELET (REPLACED BY MS27981-5B)	2	NP	
3	MS27981-5B	..EYELET (REPLACES AN227-14B)	2	SP	
4	AN227-13B	..STUD (REPLACED BY MS27981-4B)	2	NP	
4	MS27981-4B	..STUD (REPLACES AN227-13B)	2	SP	
5	AN227-12B	..SOCKET	2	SP	
6	AN227-11B	..BUTTON (REPLACED BY MS27981-1B)	2	NP	
6	MS27981-1B	..BUTTON (REPLACES AN227-11B)	2	SP	
7	206-001-361-117	..STIFFENER, BOOT ASSY (USBL ON 206-001-361-103) . .	1	P	
7	206-001-361-047	..STIFFENER, BOOT ASSY (USBL ON 206-001-361-045) . .	1		
8	206-001-361-043	..COLLAR, BOOT ASSY	1		
9	206-001-361-105	..BOOT BODY, BOOT ASSY (USBL ON 206-001-361-103) . .	1		
9	206-001-361-041	..BOOT BODY, BOOT ASSY (USBL ON 206-001-361-045) . .	1	NP	
10	MS21042L4	.NUT	2	SP	
11	NAS1149D0463J	.WASHER	4	SP	
12	NAS6604-27	.BOLT	2	SP	
		(ALTERNATE PART)			
12	20-057-4-27D	.BOLT	2	SP	
13	DELETED			
	206-001-344-105	.STICK ASSY, CYCLIC CONTROLS (S/N 53000 THRU 53172)	1		
	206-001-344-109	.STICK ASSY, CYCLIC CONTROLS (S/N 53173 THRU SUB) . .	1	P	
14	205-001-046-101	..GRIP ASSY, CYCLIC STICK (USBL ON 201-001-344-105)	1	SP	
14	205-001-046-115	..GRIP ASSY, CYCLIC STICK (USBL ON 206-001-344-109)	1	SP	
15	21223	...SWITCH, TRIGGER (REFERENCE DESIGNATOR 4A5S3) . . .	1	SP	
16	PM21230-2	...SWITCH, ICS/RADIO (REFERENCE DESIGNATOR 2303S1)	1	SP	
17	DELETED			
18	22K2-048	..NUT (REPLACED BY 90-003-40)	1	NP	
18	90-003-40	..NUT (REPLACES 22K2-048)	1	SP	
19	AN960PD416	..WASHER (REPLACED BY AN960JD416)	3	NP	
19	AN960JD416	..WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	3	P	
19	NAS1149D0463J	..WASHER (REPLACES AN960JD416)	3	SP	
20	AN24-26A	..BOLT	1	SP	
21	206-001-343-003	..ELBOW, CYCLIC STICK	1	SP	
22	206-001-342-101	..TUBE ASSY, CYCLIC STICK	1	SP	
23	MS21042L3	.NUT	1	SP	
24	NAS1149D0332J	.WASHER	2	SP	
25	NAS671-10	.NUT	1	SP	
26	206-001-745-003	.EYEBOLT ASSY, CYCLIC STICK	1	SP	
27	206-001-402-001	.SPRING, CYCLIC STICK, BALANCE	1	SP	

BHT-407-IPB

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-8. Controls installation, cyclic cockpit (Cont'd)			
28	MS27039-1-08	.SCREW	2	SP	
29	NAS1149D0363J	.WASHER	2	SP	
30	206-001-379-001	.BRACKET ASSY, CYCLIC STICK, BALANCE, SPRING	1	SP	
31	MS24665-151	.PIN	1	SP	
32	MS14144L4	.NUT	1	SP	
		(ALTERNATE PART)			
32	RME9868-4	.NUT	1	SP	
33	NAS1149D0463J	.WASHER	2	SP	
34	20-057-4-44D	.BOLT	1	SP	
		(ALTERNATE PART)			
34	NAS6604-44	.BOLT	1	SP	
35	20-032-3C	.BRACKET, BALANCING SPRING	1	SP	
36	MS24665-155	.PIN, COTTER	1	SP	
37	MS14144L5	.NUT	1	SP	
		(ALTERNATE PART)			
37	RME9868-5	.NUT	1		
38	NAS1149D0563J	.WASHER	2	SP	
39	20-057-5-30D	.BOLT	1	SP	
		(ALTERNATE PART)			
39	NAS6604-30	.BOLT	1	SP	
40	407-001-320-105	.LEVER ASSY, CPLT	1	SP	
41	MKP4	.BEARING	2	SP	
42	214-001-905-013	.SPACER	1	SP	
43	206-301-051-101	.BEARING	1	SP	
44	NAS6604-4	.BOLT	4	SP	
		(ALTERNATE PART)			
44	20-057-4-4D	.BOLT	4		
45	NAS1149D0463J	.WASHER	4	SP	
46	407-001-312-101	.SUPPORT ASSY, PIVOT, CPLT	1	SP	
47	20-007-19-31-18	.BUSHING	2	SP	
48	MS24665-151	.PIN	1	SP	
49	MS14144L4	.NUT	1	SP	
		(ALTERNATE PART)			
49	RME9868-4	.NUT	1	SP	
50	NAS1149D0463J	.WASHER	2	SP	
51	20-057-4-23D	.BOLT	1	SP	
		(ALTERNATE PART)			
51	NAS6604-23	.BOLT	1	SP	
52	MS24665-151	.PIN	1	SP	
53	MS14144L4	.NUT	1	SP	
		(ALTERNATE PART)			
53	RME9868-4	.NUT	1	SP	
54	NAS1149D0463J	.WASHER	1	SP	
55	50Z12-9-2	.SPACER	1	SP	
56	20-057-4-13D	.BOLT	1	SP	
		(ALTERNATE PART)			
56	NAS6604-13	.BOLT	1	SP	
57	MS24665-151	.PIN	1	SP	
58	MS14144L4	.NUT	1	SP	

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-8. Controls installation, cyclic cockpit (Cont'd)			
		(ALTERNATE PART)			
58	RME9868-4	.NUT	1	SP	
59	NAS1149D0463J	.WASHER	2	SP	
60	20-057-4-44D	.BOLT	1	SP	
		(ALTERNATE PART)			
60	NAS6604-44	.BOLT	1	SP	
61	20-032-3C	.BRACKET, BALANCING SPRING	1	SP	
62	206-001-377-001	.SPRING	1	SP	
63	MS21042L3	.NUT	1	SP	
64	NAS1149D0332J	.WASHER	2	SP	
65	NAS671-10	.NUT	1	SP	
66	206-001-745-001	.EYEBOLT ASSY, CYCLIC STICK	1	SP	
67	407-001-300-101	.TUBE ASSY, TORQUE, CYCLIC CONTROLS	1	SP	
68	MS24665-151	.PIN	1	SP	
69	MS14144L4	.NUT	1	SP	
		(ALTERNATE PART)			
69	RME9868-4	.NUT	1	SP	
70	NAS1149D0463J	.WASHER	1	SP	
71	140-009D17T26	.WASHER	2	SP	
72	50Z12-9-2	.SPACER	1	SP	
73	20-057-4-16D	.BOLT	1	SP	
		(ALTERNATE PART)			
73	NAS6604-16	.BOLT	1	SP	
74	MS27039-1-06	.SCREW	3	SP	
75	NAS1149D0363J	.WASHER	3	SP	
76	407-001-301-101	.PIVOT ASSY	1	SP	
77	206-001-349-001	.RETAINER	1	SP	
78	206-001-338-101	.BEARING	1	SP	
79	407-001-341-101	.LEVER	1	SP	
80	407-001-320-101	.PIVOT ASSY, PLT, CYCLIC STICK	1	SP	
81	MKP4	.BEARING	2	SP	
82	214-001-905-013	.SPACER	1	SP	
83	MS24665-155	.PIN, COTTER	1	SP	
84	206-001-351-001	.NUT	1	SP	
85	NAS1149D0463J	.WASHER	1	SP	
86	SL50-4ASP5	.NUT, BARREL	1	SP	
87	SL50-5ASP6	.NUT, BARREL	1	SP	
88	206-001-396-001	.SHAFT ASSY	1	SP	
89	NAS6604-4	.BOLT	4	SP	
		(ALTERNATE PART)			
89	20-057-4-4D	.BOLT	4		
90	NAS1149D0463J	.WASHER	4	SP	
91	206-001-397-105	.PIVOT SUPPORT ASSY, CYCLIC FRICTION	1	SP	
92	AN503-6-6	.SCREW	2	SP	
93	407-001-342-101	.SLEEVE	1	SP	
94	206-001-397-103	.PIVOT SUPPORT, CYCLIC FRICTION	1		
95	MS27039-1-08	.SCREW	3	SP	
96	NAS1149D0363J	.WASHER	3	SP	
97	206-001-376-001	.COVER, RIGGING, CYCLIC CONTROLS	1	SP	

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		<p>FIGURE: 67-8. Controls installation, cyclic cockpit (Cont'd)</p> <p>AVAIL CODE DEFINITION</p> <p>P Procurable NP Non Procurable SP Normal stock/procurable See introduction on availability codes for additional information.</p>			

1. Screw	15. Screw	29. Nut	43. Washer
2. Boot	16. Washer	30. Bolt	44. Bolt
3. Stick, cyclic	17. Cover	31. Washer	45. Washer
4. Nut	18. Pivot support	32. Yoke, right	46. Bolt
5. Washer	19. Barrel nut	33. Nut	47. Washer
6. Lever assembly	20. Washer	34. Washer	48. Pivot support
7. Washer	21. Nut	35. Washer	49. Nut
8. Bolt	22. Retainer	36. Bolt	50. Washer
9. Screw	23. Nut	37. Nut	51. Spacer
10. Bearing, split friction	24. Washer	38. Washer	52. Bushing
11. Bolt	25. Washer	39. Yoke, left	53. Eyebolt
12. Washer	26. Torque tube	40. Eyebolt	54. Nut
13. Knob and shaft	27. Bolt	41. Lever assembly	55. Control tube elevator
14. Barrel nut	28. Washer	42. Nut	

L206001-15-2B

Figure 27-6. Cyclic stick and torque tube (Sheet 2 of 2)

27-31. INSTALLATION — CYCLIC STICK AND TORQUE TUBE.

1. Apply vinyl tape (item 101, table C-1) to maintaining surfaces of pivot support (48, figure 27-6) and cabin floor. Install pivot support (48) using bolts (44) and washers (45). Torque bolts (44) 40 to 50 inch-pounds.

2. Position lever assembly (41) in pivot support (48). Install bolt (46) with washers (43 and 47) and nut (42). Torque nut (42) 50 to 70 inch-pounds plus friction drag of nut and install cotter pin.

3. Prior to installing lever assembly (6) in pivot support (18) apply Fluoro-Glide, Fluorocarbon, Dry Lubricant (item 418) to bearing bore of pivot support (18) as follows:

a. Remove oil, paint, prime from bearing bore of pivot support (18) using MEK (item 303) and air dry.

b. Spray Fluoro-Glide, Fluorocarbon dry lubricant (item 418) into bearing bore of pivot support (18) from a distance of approximately eight inches. Protect surrounding area from over spray.

c. Allow Fluoro-Glide Fluorocarbon dry lubricant (item 418) to air dry thoroughly. Lightly buff surface with clean soft cloth to improve lubricity.

4. Install pivot support (18) using bolts (11) and washers (12). Torque bolts (11) 40 to 50 inch-pounds.

5. Apply vinyl tape (item 101, table C-1) to mating surfaces of cover (17) and bottom of cabin floor. Install cover (17) using screws (15) and washers (16).

6. Position assembled lever assembly (6) in pivot support (18) with slot in retainer (22) and slot in split friction bearing (10) aligned with slot in pivot support (18). Install three screws (9) with slot in support (18) or at 90 degree whichever will give the best cyclic friction (minimum).

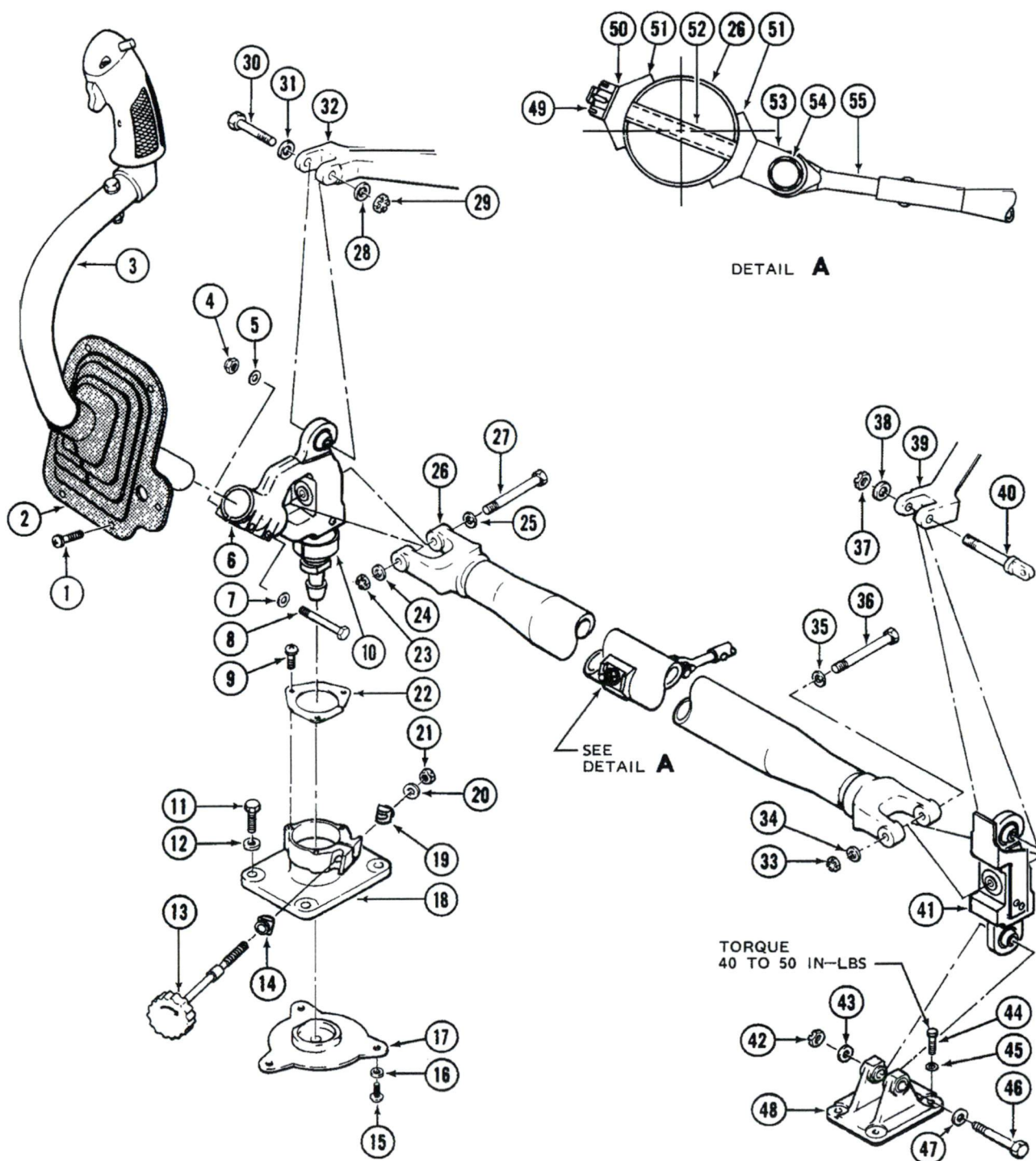
CAUTION: DO NOT USE SCREWDRIVER OR WEDGE OF ANY TYPE TO SPREAD SLOT IN PIVOT SUPPORT (18) TO AID IN INSTALLATION OF SPLIT FRICTION BEARING (10). SPREADING SLOT IN SUPPORT (18) RESULTS IN EXCESSIVE STRESS IN RELIEF HOLE OF SLOT WHICH COULD CAUSE CRACKS.

7. Insert knob and shaft (13) through hole in boot (2). Place barrel nut (14) on knob and shaft (13) until one to two threads are engaged in both barrel nuts. Install washer (20) and nut (21). Tighten nut (21) finger tight and install cotter pin.

8. If eyebolt (53) for elevator controls was removed from torque tube (26), install as follows: (See figure 27-6, detail A.)

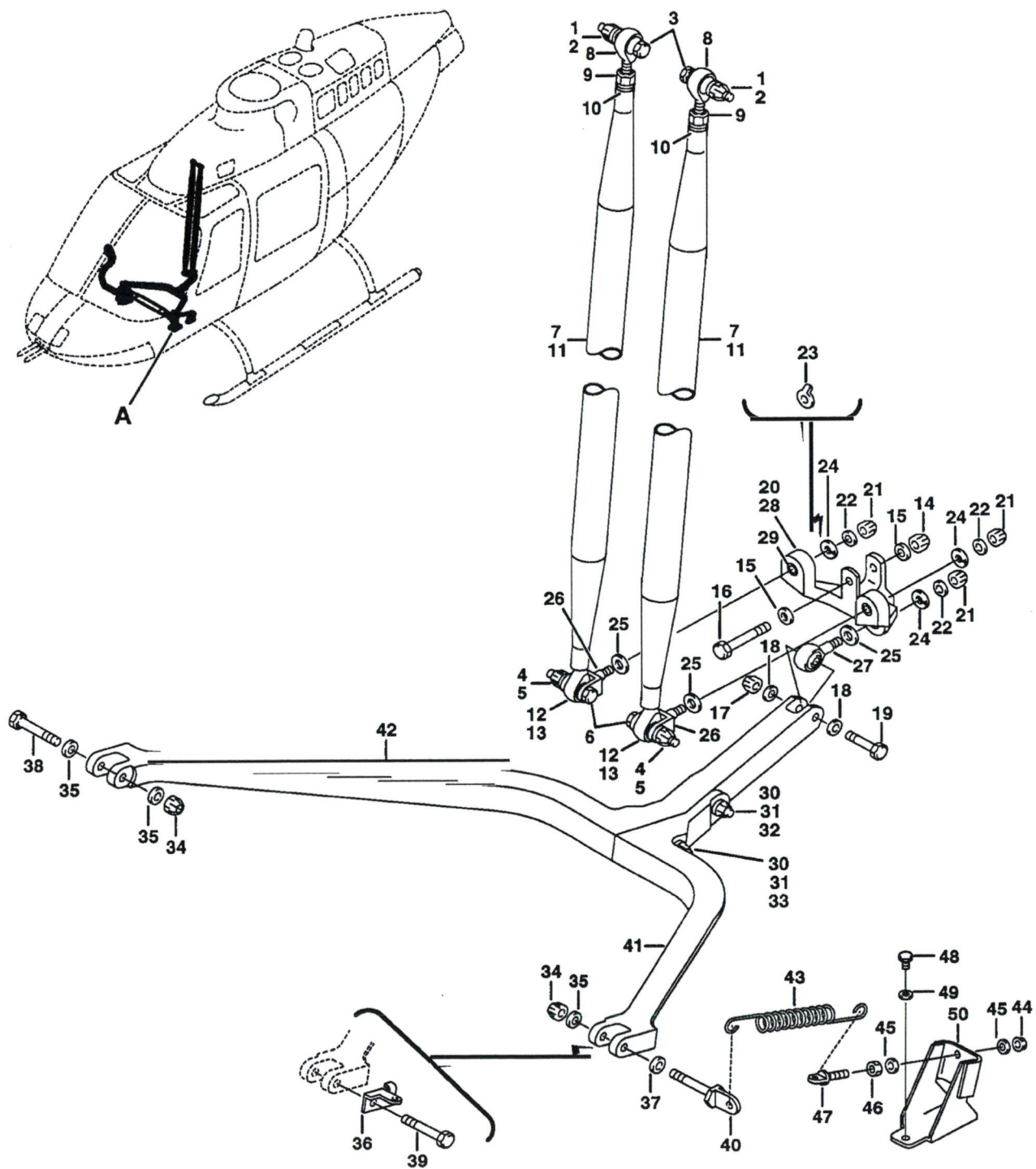
a. Place spacers (51) and bushing (52) on eyebolt (53) and install through hole in aft side of torque tube (26).

b. Install opposite spacer (51), washer (50), and nut (49). Do not torque nut (49) at this time.



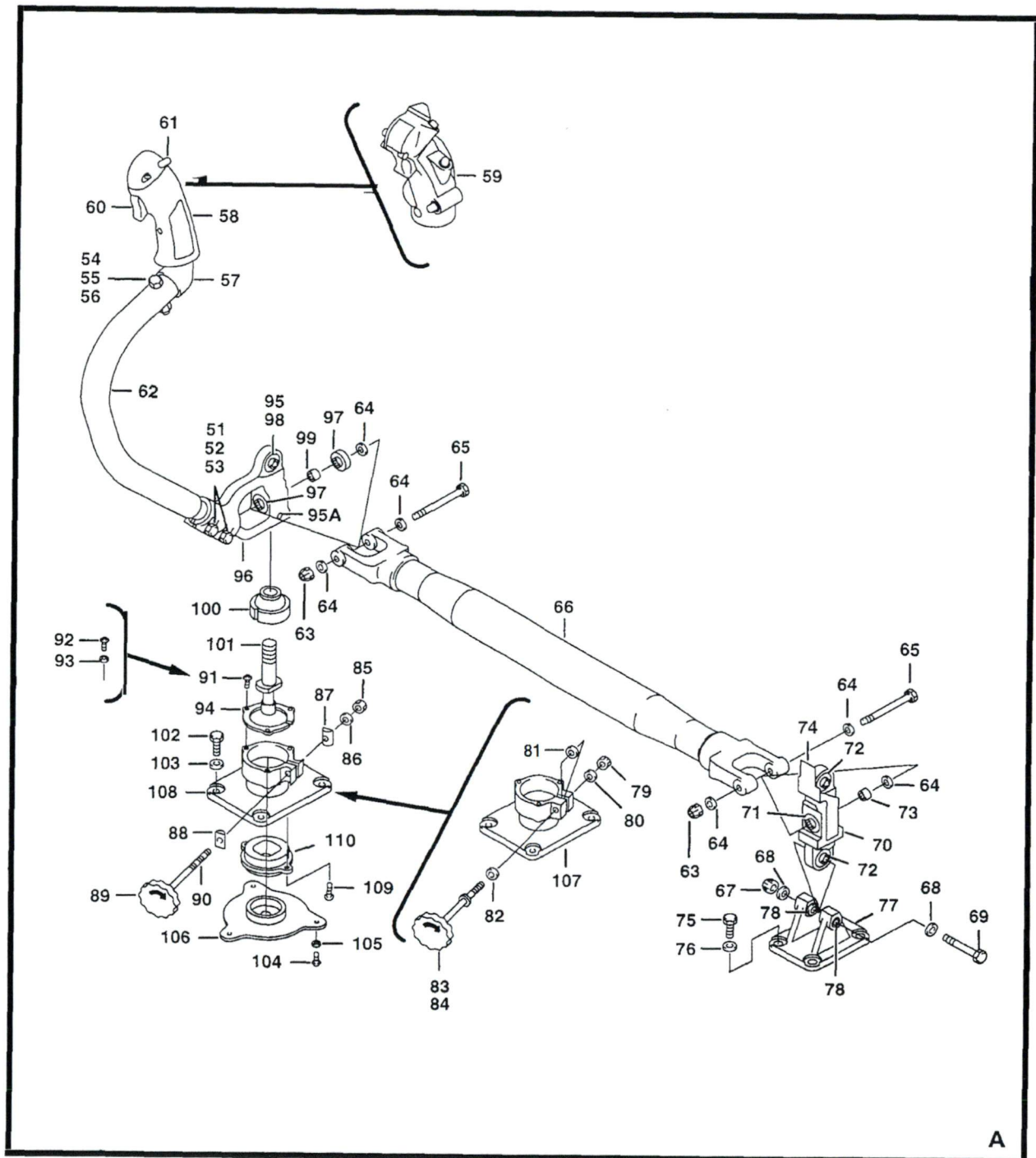
L206001-15-1A

Figure 27-6. Cyclic stick and torque tube (Sheet 1 of 2)



206A/B/B3-67-1005-1
C000

Figure 67-5. Controls installation, cyclic (Sheet 1 of 2)



206A/B/B3-67-1005-2
C0000

Figure 67-5. Controls installation, cyclic (Sheet 2)

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FOR BEST VALUE, BUY GENUINE BELL PARTS

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(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic			
	206-001-011-001	CONTROLS INSTL, CYCLIC	1		
	206-001-011-003	CONTROLS INSTL, CYCLIC	1		
	206-001-011-005	CONTROLS INSTL, CYCLIC	1		
	206-001-011-007	CONTROLS INSTL, CYCLIC	1		
	206-001-011-009	CONTROLS INSTL, CYCLIC	1		
	206-001-011-011	CONTROLS INSTL, CYCLIC	1		
	206-001-011-013	CONTROLS INSTL, CYCLIC	1		
	206-001-011-017	CONTROLS INSTL, CYCLIC	1		
	206-001-011-023	CONTROLS INSTL, CYCLIC	1		
	206-001-011-101	CONTROLS INSTL, CYCLIC	1		
	206-001-011-103	CONTROLS INSTL, CYCLIC	1		
1	MS17825-4	.NUT (REPLACED BY MS14144L4)	2	0	
1	MS14144L4	.NUT (REPLACES MS17825-4)	2	1	
2	NAS1197-416	.WASHER	2	1	M
2	AN960PD416	.WASHER (REPLACED BY AN960JD416)	2		Y
2	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	2		Y
2	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	2		Y
3	NAS334C13	.BOLT	2	1	M
3	NAS334CP11	.BOLT	2	1	Y
4	MS17825-4	.NUT (REPLACED BY MS14144L4)	2	0	
4	MS14144L4	.NUT (REPLACES MS17825-4)	2	1	
5	AN960-416L	.WASHER (REPLACED BY NAS1149F0432P)	2	1	
5	NAS1149F0432P	.WASHER (REPLACES AN960-416L)	2		
6	AN174-10	.BOLT	2	1	
7	206-001-022-043	.TUBE ASSY, ADJUSTABLE FLIGHT CONTROLS	2		G
7	206-001-096-037	.TUBE ASSY, ADJUSTABLE FLIGHT CONTROLS (REPLACED . BY 206-001-096-001)	2	0	W
7	206-001-096-001	.TUBE ASSY, ADJUSTABLE FLIGHT CONTROLS (REPLACES . 206-001-096-037)	2	1	W
8	206-001-052-001	. . BEARING, PLAIN, ROD END	1	1	
9	AN316-6R	. . NUT	1	1	
10	AN960PD616	. . WASHER (REPLACED BY AN960JD616)	1		
10	AN960JD616	. . WASHER (REPLACES AN960PD616) (REPLACED BY NAS1149D0663J)	1		
10	NAS1149D0663J	. . WASHER (REPLACES AN960JD616)	1		
11	206-001-022-045	. . TUBE ASSY, ADJUSTABLE FLIGHT CONTROLS (USBL ON . . 206-001-022-043)	2		G
11	206-001-096-039	. . TUBE ASSY, ADJUSTABLE FLIGHT CONTROLS (USBL ON . . 206-001-096-037)	1		W
11	206-001-096-003	. . TUBE ASSY, ADJUSTABLE FLIGHT CONTROLS (USBL ON . . 206-001-096-001)	1	6	W
12	206-001-055-001	. . . BEARING, PLAIN ROD END (USBL ON 206-001-096-039, 206-001-022-045)	1	1	
12	209-001-053-001	. . . BEARING, PLAIN, ROD END (USBL ON 206-001-096-003)	1	1	
13	214-001-024-001	. . . INSERT	1	1	
14	MS17825-5	.NUT (REPLACED BY MS14144L5)	1		
14	MS14144L5	.NUT (REPLACES MS17825-5)	1	1	
15	AN960PD516	.WASHER (REPLACED BY AN960JD516)	2		

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic (Cont'd)			
15	AN960JD516	.WASHER (REPLACES AN960PD516) (REPLACED BY NAS1149D0563J)	2	1	
15	NAS1149D0563J	.WASHER (REPLACES AN960JD516)	2	1	
16	AN175-17	.BOLT (ALTERNATE PART)	1	1	
16	20-057-5-23D	.BOLT	1	1	
17	MS17825-4	.NUT (REPLACED BY MS14144L4)	1	0	
17	MS14144L4	.NUT (REPLACES MS17825-4)	1	1	
18	NAS1197-416	.WASHER	2	1	
19	AN174-13	.BOLT	1	1	
20	206-001-363-001	.LEVER ASSY, MIXING	1		C
20	206-001-363-009	.LEVER ASSY, MIXING	1	1	R
21	MS17825-4	.NUT (REPLACED BY MS14144L4)	3	0	
21	MS14144L4	.NUT (REPLACES MS17825-4)	3	1	
22	120-003-16-9	.SHIM	3	1	
23	206-001-065-001	.WASHER, THRUST (USBL ON 206-001-363-001)	3	0	C
24	206-001-067-003	.WASHER, SLOTTED THRUST (USBL ON 206-001-363-009)	3	1	R
25	206-001-062-003	.WASHER, THRUST	3	1	
26	206-001-061-001	.CLEVIS (USBL ON 206-001-363-001)	2	0	C
26	206-001-061-003	.CLEVIS (USBL ON 206-001-363-009)	2	1	R
27	206-001-057-001	.BEARING (USBL ON 206-001-363-001)	1	0	C
27	206-001-057-003	.BEARING (USBL ON 206-001-363-009)	1	1	R
28	206-001-363-005	.LEVER ASSY	1	1	
29	06DU08	.BUSHING	3	1	
30	NAS679A4	.NUT (REPLACED BY MS21042L4)	2	0	
30	MS21042L4	.NUT (REPLACES NAS679A4)	2	1	
31	NAS1197-416	.WASHER	4	1	
32	AN4-17A	.BOLT	1	1	
33	AN4-30A	.BOLT	1	1	
34	MS17825-5	.NUT (REPLACED BY MS14144L5)	2		
34	MS14144L5	.NUT (REPLACES MS17825-5)	2	1	
35	NAS1197-516	.WASHER	3	1	
36	206-001-391-001	.CLIP	1		K
37	NAS1197-516	.WASHER	1	1	P
38	AN175-16	.BOLT	1	1	H
38	NAS1305-22D	.BOLT (REPLACED BY NAS6605D22)	1		X
38	NAS6605D22	.BOLT (REPLACES NAS1305-22D)	1		X
39	AN175-16	.BOLT	1	1	D
40	206-001-380-001	.EYEBOLT	1	1	T
41	206-001-322-003	.YOKE, LH	1	1	
42	206-001-323-001	.YOKE, RH	1	1	
43	206-001-377-001	.SPRING	1	1	S
44	NAS679A3	.NUT (REPLACED BY MS21042L3)	1		S
44	MS21042L3	.NUT (REPLACES NAS679A3)	1	1	S
45	AN960PD10L	.WASHER (REPLACED BY AN960JD10L)	2		S
45	AN960JD10L	.WASHER (REPLACES AN960PD10L) (REPLACED BY NAS1149D0332J)	2		S
45	NAS1149D0332J	.WASHER (REPLACES AN960JD10L)	2		S
46	NAS671-10	.NUT	1	1	S

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(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic (Cont'd)			
47	206-001-745-001	.EYEBOLT ASSY	1	1	J
47	206-001-745-003	.EYEBOLT ASSY	1	1	V
48	AN3-3A	.BOLT	2	1	S
49	AN960PD10	.WASHER (REPLACED BY AN960JD10)	2		S
49	AN960JD10	.WASHER (REPLACES AN960PD10) (REPLACED BY NAS1149D0363J)	2		S
49	NAS1149D0363J	.WASHER (REPLACES AN960JD10)	2		S
50	206-001-379-001	.BRACKET ASSY	1	1	J
50	206-001-375-001	.BRACKET ASSY	1	1	V
51	MS21042L4	.NUT	2	1	
52	AN960PD416	.WASHER (REPLACED BY AN960JD416)	4		
52	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	4		
52	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	4		
53	AN4-21A	.BOLT	2	1	
	206-001-344-001	.STICK ASSY, CYCLIC	1	0	N
	206-001-344-101	.STICK ASSY, CYCLIC	1		Z
54	90-003-40	.NUT	1	1	
55	AN960PD416	.WASHER (REPLACED BY AN960JD416)	3		
55	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	3		
55	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	3		
56	AN24-26A	.BOLT	1	1	
57	206-001-343-001	.ELBOW	1		
58	206-001-359-001	.GRIP ASSY (ALTERNATE PART)	1	1	
59	21110-1	.GRIP ASSY (SEE FIG. 10 FOR BREAKDOWN) (REPLACED . BY PM21110-1)	1	0	
59	PM21110-1	.GRIP ASSY (SEE FIG. 10 FOR BREAKDOWN) (REPLACES . 21110-1)	1	6	
60	90-367	...SWITCH (USBL ON 206-001-359-001)	1	1	
61	90-370	...SWITCH (USBL ON 206-001-359-001)	1	1	
62	206-001-342-001	.TUBE ASSY, CYCLIC STICK	1	1	N
62	206-001-342-101	.TUBE ASSY, CYCLIC STICK	1	1	Z
63	MS17825-4	.NUT (REPLACED BY MS14144L4)	2	0	
63	MS14144L4	.NUT (REPLACES MS17825-4)	2	1	
64	AN960PD416	.WASHER (REPLACED BY AN960JD416)	6		
64	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	6		
64	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	6		
65	AN174-30	.BOLT	2	1	
66	206-001-306-011	.TUBE ASSY, TORQUE	1	1	
67	MS17826-5	.NUT (REPLACED BY MS14145L5)	1	0	
67	MS14145L5	.NUT (REPLACES MS17826-5)	1	1	
68	NAS1197-516	.WASHER	2	1	
69	AN175-21	.BOLT	1	1	
70	206-001-339-011	.LEVER ASSY	1	0	A
70	206-001-339-027	.LEVER ASSY	1	6	E
70	206-001-339-023	.LEVER ASSY (REPLACED BY 206-001-400-009 AND -115)	1	0	Q

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic (Cont'd)			
70	206-001-400-009	.LEVER ASSY (REPLACES 206-001-339-023) (REPLACED BY 206-001-400-115)	1		Q
70	206-001-400-115	.LEVER ASSY (REPLACES 206-001-339-023 AND 206-001-400-009)	1	1	Q
71	MS20200KP4	..BEARING (REPLACES BY MS27640-4)	2	0	
71	MS27640-4	..BEARING (REPLACES MS20200KP4)	2	1	
72	206-001-053-003	..BEARING (USBL ON 206-001-339-011 AND -027)	2	0	AE
72	206-001-053-005	..BEARING (USBL ON 206-001-339-023, 206-001-400-009 AND -115) (REPLACED BY 206-301-051-101)	2	1	Q
72	206-301-051-101	..BEARING (USBL ON 206-001-339-023, 206-001-400-009 AND -115) (REPLACES 206-001-053-005)	2	1	Q
73	214-001-339-009	..SPACER (USBL ON 206-001-339-023)	1		Q
73	214-001-905-013	..SPACER (USBL ON 206-001-400-009 AND -115)	1	1	Q
74	206-001-340-001	..SHIELD	1	6	
75	AN4-5A	.BOLT	4	1	
76	NAS1197-416	.WASHER	4	1	
77	206-001-330-001	.SUPPORT ASSY, PIVOT	1	1	
78	85B7-19-31-18	..BUSHING (REPLACES BY 22-007-19-31-18)	2		
78	22-007-19-31-18	..BUSHING (REPLACES 85B7-19-31-18)	2	1	
79	MS17826-4	.NUT (REPLACES BY MS14145L4)	1		C
79	MS14145L4	.NUT (REPLACES MS17826-4)	1	1	C
80	120-035-16-8	.SHIM	1	1	C
81	50Z16-9-1	.SPACER	1	1	C
82	AN960PD416	.WASHER (REPLACES BY AN960JD416)	1		C
82	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	1		C
82	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	1		C
83	206-001-336-005	.KNOB AND SHAFT ASSY	1		C
84	206-001-335-001	..KNOB	1	1	C
85	206-001-351-001	.NUT	1	1	R
86	AN960PD416	.WASHER (REPLACES BY AN960JD416)	1		R
86	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	1		R
86	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	1		R
87	SL50-4ASP5	.NUT, BARREL	1	1	U
88	SL50-5ASP6	.NUT, BARREL	1	1	U
	206-001-348-001	.KNOB AND SHAFT ASSY	1		L
	206-001-396-001	..SHAFT ASSY	1	1	U
89	206-001-335-001	..KNOB	1	1	
90	206-001-325-001	..SHAFT (USBL ON 206-001-348-001)	1	1	L
90	206-001-395-001	..SHAFT (USBL ON 206-001-396-001)	1	1	U
91	AN525-10R6	.SCREW	3	1	R
92	AN525-10R6	.SCREW	3	1	C
93	AN960PD10L	.WASHER (REPLACES BY AN960JD10L)	3		C
93	AN960JD10L	.WASHER (REPLACES AN960PD10L) (REPLACED BY NAS1149D0332J)	3		C
93	NAS1149D0332J	.WASHER (REPLACES AN960JD10L)	3		C
94	206-001-349-001	.RETAINER	1	1	R

BHT-206A/B-SERIES-IPB

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic (Cont'd)			
95	206-001-345-001	.PIVOT ASSY, PILOTS (REPLACED BY 206-001-345-003)	1	0	B
95	206-001-345-003	.PIVOT ASSY, PILOTS (REPLACES 206-001-345-001) . . . (REPLACED BY 206-001-345-007)	1		F
95	206-001-345-007	.PIVOT ASSY, PILOTS (REPLACES 206-001-345-001 . . . AND -003) (REPLACED BY 206-001-345-009)	1	6	N
95	206-001-345-009	.PIVOT ASSY, PILOTS (REPLACES 206-001-345-001, . . . -003 AND -007)	1	1	
95A	MS20470AD4	..RIVET (NOTE 1)	1		
96	206-001-339-005	..LEVER ASSY, PILOTS (USBL ON 206-001-345-001) . . . (REPLACED BY 206-001-339-019 AND -033)	1		B
96	206-001-339-019	..LEVER ASSY, PILOTS (USBL ON 206-001-345-001 AND -003) (REPLACES 206-001-339-005) (REPLACED BY 206-001-339-033)	1		F
96	206-001-339-033	..LEVER ASSY, PILOTS (USBL ON 206-001-345-001, . . . -003 AND -007) (REPLACES 206-001-339-005 AND -019)	1	1	N
96	206-001-400-005	..LEVER ASSY, PILOTS (USBL ON 206-001-345-009) . . . (REPLACED BY 206-001-400-101 AND -111)	1	0	
96	206-001-400-101	..LEVER ASSY, PILOTS (USBL ON 206-001-345-009) . . . (REPLACES 206-001-400-005) (REPLACED BY 206-001-400-111)	1		
96	206-001-400-111	..LEVER ASSY, PILOTS (USBL ON 206-001-345-009) . . . (REPLACES 206-001-400-005 AND -101)	1	1	
97	MS20200KP4	...BEARING (REPLACED BY MS27640-4)	2	0	
97	MS27640-4	...BEARING (REPLACES MS20200KP4)	2	1	
98	206-001-053-003	...BEARING (USBL ON 206-001-339-005)	1	0	B
98	206-001-053-005	...BEARING (USBL ON 206-001-339-019, -033 AND 206-001-400-005) (REPLACED BY 206-301-051-101)	1	1	F
98	206-301-051-101	...BEARING (REPLACES 206-001-053-005)	1	1	F
99	206-001-339-009	...SPACER (USBL ON 206-001-339-005, -019 AND -033)	1	6	N
99	214-001-905-013	...SPACER (USBL ON 206-001-400-005, -101 AND -111)	1	1	
100	206-001-338-001	..BEARING (REPLACED BY 206-001-338-101)	1	0	
100	206-001-338-101	..BEARING (REPLACES 206-001-338-001)	1	1	
101	206-001-346-001	..LEVER (REPLACED BY 206-001-346-003)	1		
101	206-001-346-003	..LEVER (REPLACES 206-001-346-001)	1	1	
102	AN4-6A	.BOLT	4	1	
103	AN960PD416	.WASHER (REPLACED BY AN960JD416)	4		
103	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	4		
103	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	4		
104	AN525-10R6	.SCREW	3	1	
105	NAS1197-10	.WASHER	3	1	
106	206-001-356-003	.COVER, RIGGING FIXTURE (REPLACED BY 206-001-356-001)	1		D
106	206-001-376-001	.COVER, RIGGING FIXTURE (REPLACES 206-001-376-003)	1	1	

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic (Cont'd)			
107	206-001-360-001	.PIVOT SUPPORT ASSY	1		C
107	206-001-360-005	.PIVOT SUPPORT ASSY	1		L
108	206-001-397-001	.SUPPORT ASSY, PIVOT (REPLACED BY 206-001-397-101)	1		U
108	206-001-397-101	.SUPPORT ASSY, PIVOT (REPLACES 206-001-397-001) . .	1	1	U
109	AN503-6-6	..SCREW	2	1	
110	206-001-328-007	..SLEEVE	1	1	
		NOTE 1: LENGTH IS -22 OR -23 TO BE DETERMINED ON INSTALLATION.			
		USABLE ON CODES			
		CODE MODEL SERIAL NUMBER			
		A 206A 4-103			
		B 206A 4-153			
		C 206A 4-203			
		D 206A 4-583			
		E 206A 104-153			
		F 206A/B 4-1413			
		G 206A/B 4-1662			
		H 206A/B 4-2211			
		J 206A/B 304-1413			
		K 206A/B 584-1413			
		L 206A/B 204-1630, 1632-1651			
		M 206A/B/BIII 4-2622			
		N 206A/B/BIII 4-3566			
		P 206A/B/BIII 4-583, 1414-SUB			
		Q 206A/B/BIII 154-SUB			
		R 206A/B/BIII 204-SUB			
		S 206A/B/BIII 304-SUB			
		T 206A/B/BIII 584-SUB			
		U 206B/BIII 1631, 1652-SUB			
		V 206B/BIII 1414-SUB			
		W 206B/BIII 1663-SUB			
		X 206BIII 2212-SUB			
		Y 206BIII 2623-SUB			
		Z 206BIII 3567-SUB			
		1) UNLESS A USABLE ON PART NUMBER IS LISTED IN THE ITEM NAME COLUMN; NO CODE INDICATES THE PART APPLIES TO ALL SERIAL NUMBERS.			
		2) IF THE SERIAL NUMBER IS BLANK THE PART APPLIES TO ALL SERIAL NUMBERS FOR THAT MODEL.			

11. Adjust control tubes (16 and 17) to fit. Torque jam nuts 80 to 100 inch-pounds.

NOTE: Control tubes (16 and 17) should be approximately equal in length.

12. Connect control tubes (16 and 17) to swashplate (18) with bolt, two washers and nut. Torque nut 60 to 85 inch-pounds plus friction drag, and install cotter pin.

13. Remove (T102019) rigging tool from servo actuators (10 and 11).

14. Check adjustment of cyclic stick balance spring in accordance with paragraph 27-27.

15. Coat threads of all adjustable rod-end bearings and fittings on control tubes with corrosion preventive compound (item 410).

16. To assure clearance between cyclic yoke (5D, figure 27-1) and elevator control tube (5C), apply hydraulic pressure to the boost actuators by means of an auxiliary hydraulic power cart. Position the collective stick in its full up position and check clearance between the yoke and the elevator tube as the cyclic stick is moved to its full forward and forward corner positions. If parts make contact, shorten collective control tube (5) to provide 0.020 to 0.040 inch clearance at the most critical stick position, then shorten cyclic control tube (5A and 5B) by the same amount as collective control tube (5).

NOTE: Perform clearance check between swashplate inner ring and pivot sleeve after rigging collective and cyclic controls.

16A. To assure clearance between swashplate inner ring and pivot sleeve, apply hydraulic pressure to the servo actuators by means of an auxiliary hydraulic power cart. Position the cyclic control stick to extreme control positions. If contact between the inner ring and pivot sleeve is made on aft side, shorten control tubes (9) the same amount to obtain 0.010 to 0.030 inch clearance. If contact between the inner ring and pivot sleeve is made on forward side, lengthen control tubes (9) the same amount to obtain 0.010 to 0.030 inch clearance on forward side of sleeve or until the minimum clearance on aft side is reduced to 0.010 inch.

17. Check cyclic controls to ensure that all safety devices (cotter pins and lockwire) are installed. Check controls for freedom of operation without binding or interference.

27-27. ADJUSTMENT — CYCLIC STICK BALANCE SPRING.

NOTE: The balance spring (5, figure 27-5) is used in the system to minimize the cyclic stick mass imbalance forces and elevator induced forces in the longitudinal control system.

1. Place cyclic stick in the extreme aft position against stick stop (figure 27-5, Detail E).

2. Adjust eyebolt (29) to obtain balance spring length of 4.90 for single controls or 6.18 for dual controls (figure 27-5, Detail E). Secure with jamnut.

27-27A. ADJUSTMENT CYCLIC FRICTION.

At the time of ground run of ship, adjust friction knob (1, figure 27-5) until a spring scale applied at center of grip indicates a breakaway force of 1.0 lb. \pm 0.5 lb., torque nut (27) finger tight and secure. A maximum of 8 washers may be used to position nut in line with cotter pin hole in shaft.

27-28. CYCLIC STICK AND TORQUE TUBE.

The cyclic stick extends upward and forward from the front of the pilot's seat. Switches are installed on the stick grip for the intercom system and radio. The torque tube connects to the cyclic stick support and provides a mounting point for the elevator controls. (See figure 27-6.)

27-29. REMOVAL — CYCLIC STICK AND TORQUE TUBE.

1. Remove access panels as required.

2. Remove cyclic stick (3, figure 27-6) as follows:

a. Disconnect electrical connector at bottom of stick.

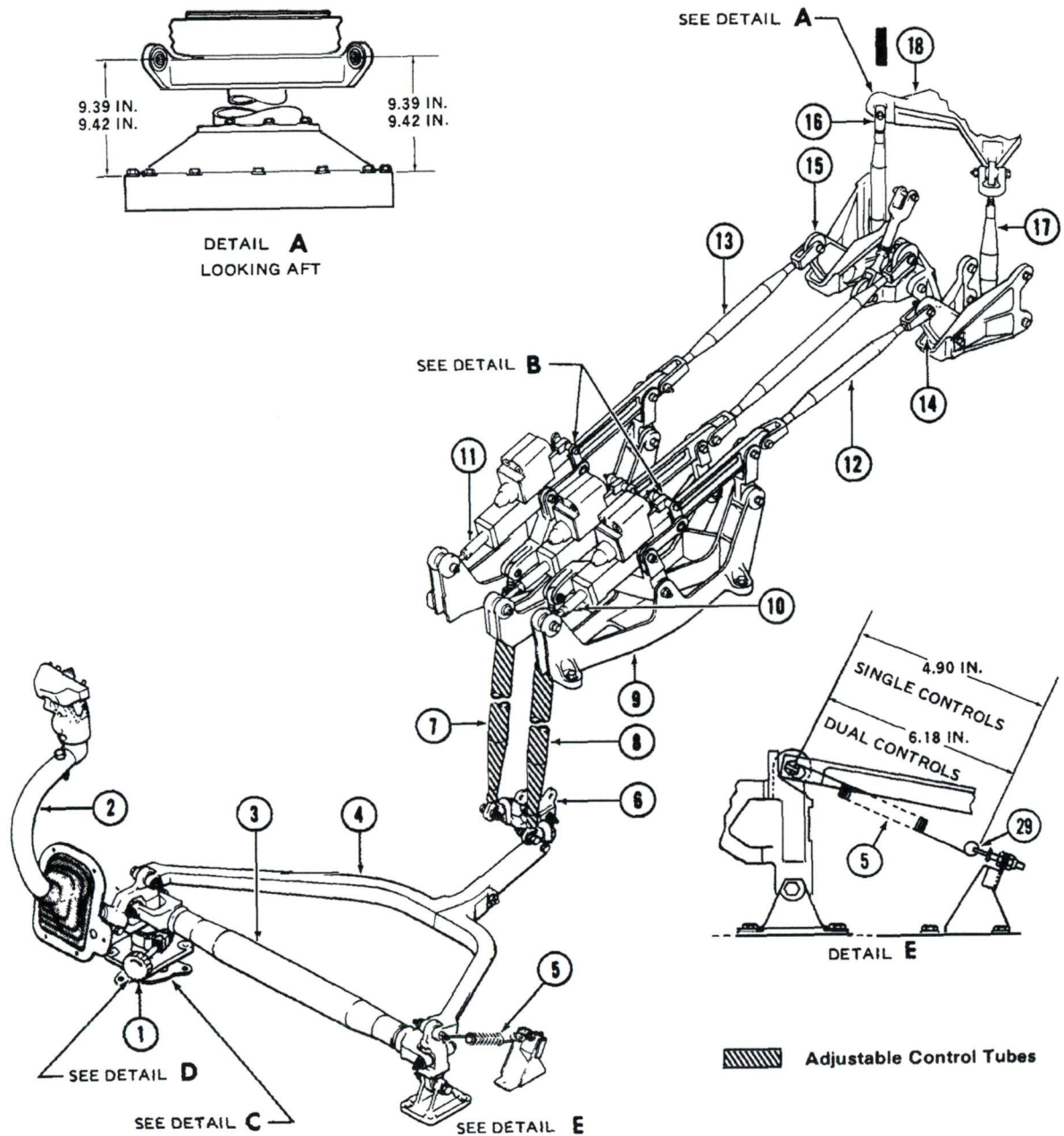
b. Remove screws (1) and slide boot (2) upward on cyclic stick (3).

c. Remove nuts (4), washers (5 and 7) and bolts (8) from lever assembly (6).

d. Remove cyclic stick (3) from lever assembly (6) and boot (2). Guide electrical cable through lever assembly as stick is removed.

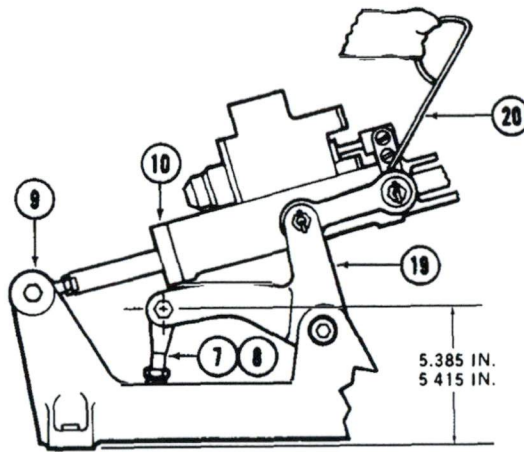
3. Remove torque tube (26) as follows:

a. Remove bolt, washers, and nut (54) to disconnect elevator control tubes (55) from eyebolt (53). (See figure 27-6, detail A.)



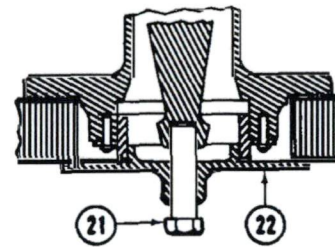
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Figure 27-5. Cyclic controls (Sheet 1 of 2)

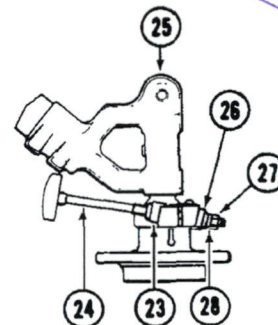


DETAIL B

1. Cyclic Friction Adjuster
2. Cyclic Control Stick
3. Torque Tube
4. Yoke
5. Spring
6. Mixing Lever
7. Control Tube
8. Control Tube
9. Support
10. Servo Actuator
11. Servo Actuator
12. Control Tube
13. Control Tube
14. Bellcrank
15. Bellcrank
16. Control Tube
17. Control Tube
18. Swashplate
19. Bellcrank



DETAIL C



DETAIL D

20. T102019 Rigging Tool
21. Bolt
22. Cover
23. Barrel Nut
24. Friction Adjuster Shaft
25. Cyclic Stick Pivot
26. Barrel Nut
27. Nut
28. Washer (Max. 8 Req'd.)
29. Eyebolt

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Figure 27-5. Cyclic controls (Sheet 2 of 2)

SCHEDULED INSPECTIONS**5-6. SCHEDULED INSPECTIONS**

Scheduled inspections include the airframe and the component inspections. The scheduled airframe inspection intervals are related to the airframe operating time. The scheduled component inspection intervals are related to the component operating time.

5-7. AIRFRAME INSPECTION PROGRAM

Bell Helicopter Textron has developed two airframe inspection programs that give you the flexibility to permit maximum helicopter use. They are the airframe periodic inspection and the airframe progressive inspection. You can choose one of the Bell programs or you can design your own program. You are responsible for the selection of an inspection program and for its approval by the governing civil aviation authority.

5-8. Airframe Progressive Inspection Program

If you choose the airframe progressive inspection program you must first get approval from your local airworthiness authority. This inspection is divided into six separate events of similar workload.

Do an event of the airframe progressive inspection (Paragraph 5-12) at intervals of 50 hours. After you complete event six (6), the cycle begins again with event number one (refer to Table 5-1). You must do a minimum of one complete cycle (all six events) within a 12 calendar month period. You also need to do the following:

1. a 12 month inspection (Paragraph 5-14) every 12 calendar months.
2. a 24 month inspection (Paragraph 5-15) every 24 calendar months.
3. a 1200 hour/24 month inspection (Paragraph 5-16) every 1200 hours or 24 calendar months, whichever occurs first.

Table 5-1. Progressive Inspection Events

AIRFRAME HOURS	EVENT NUMBER	MAINTENANCE ZONES
50	1	1 & 2
100	2	3
150	3	4
200	4	5 & 6
* 250	5	7 & 8
300	6	9 & 10

5-9. Airframe Periodic Inspection Program

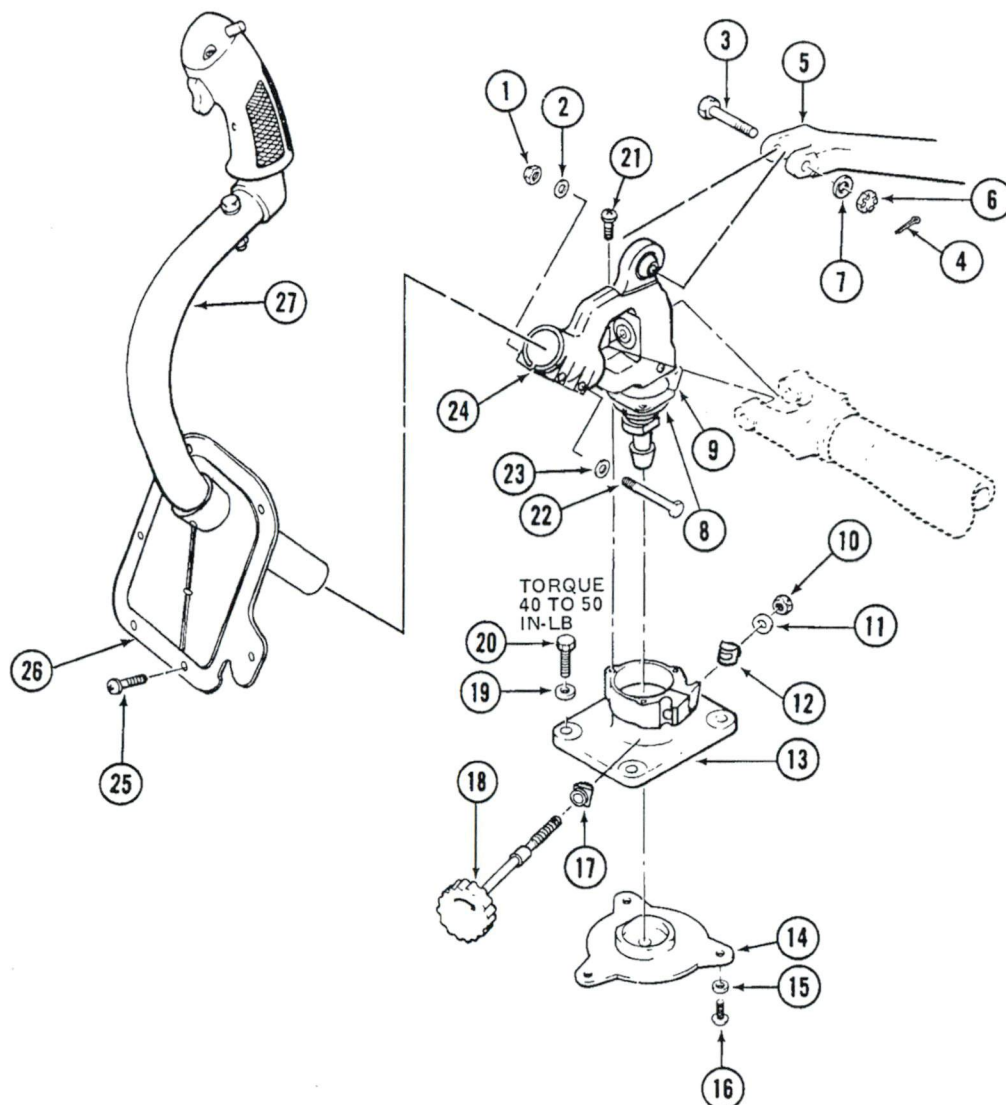
Do an airframe periodic inspection (Paragraph 5-13) every 12 calendar months or every 300 hours, whichever occurs first. You must do a minimum of one complete airframe periodic inspection within a 12 month calendar period. You also need to do an inspection at the following intervals:

1. a 12 month inspection (Paragraph 5-14) every 12 calendar months.
2. a 24 month inspection (Paragraph 5-15) every 24 calendar months.
3. a 1200 hour/24 month inspection (Paragraph 5-16) every 1200 hours or 24 calendar months, whichever occurs first.

5-10. CHANGING INSPECTION PROGRAM

You must use either the airframe periodic inspection program or the airframe progressive inspection program from the start. You can change between the two programs at any airframe operating time. To change from an airframe progressive inspection program to an airframe periodic inspection program (or to change your progressive inspection event sequences), do a complete 300 hour airframe periodic inspection (you will repeat some of the inspection). To change from an airframe periodic inspection program to an airframe progressive inspection program, do a complete 300 hour airframe periodic inspection.

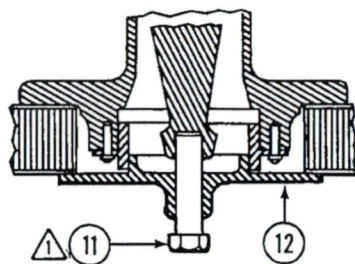
You are responsible for not exceeding the specific time interval of any scheduled airframe inspection procedure.



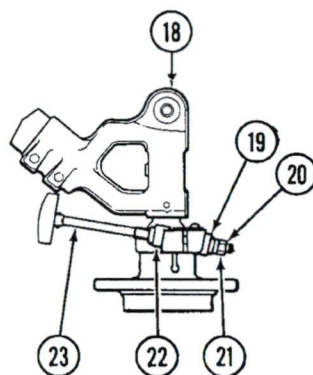
- | | | |
|---------------------------|---------------------|---------------------|
| 1. Nut | 12. Barrel Nut, | 21. Screw |
| 2. Aluminum Washer | 13. Pivot Support | 22. Bolt |
| 3. Bolt | 14. Cover | 23. Aluminum Washer |
| 4. Cotter Pin | 15. Special Washer | 24. Lever Assembly |
| 5. Right Yoke | 16. Screw | 25. Screw |
| 6. Nut | 17. Barrel Nut | 26. Boot |
| 7. Special Washer | 18. Knob and Shaft | 27. Cyclic Stick |
| 8. Split Friction Bearing | 19. Aluminum Washer | |
| 9. Retainer | 20. Bolt | |
| 10. Nut | | |
| 11. Aluminum Washer | | |

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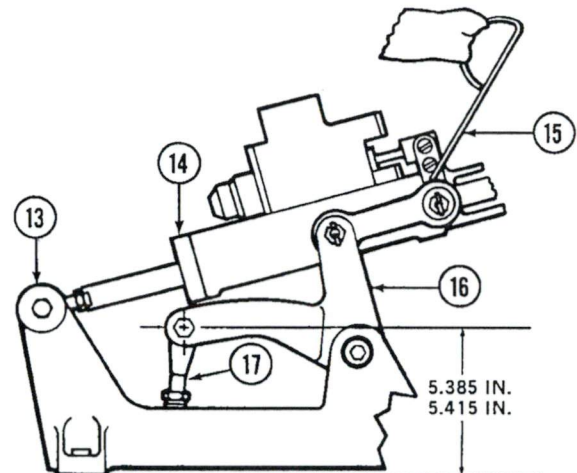
Figure 27-8. Cyclic stick and torque tube (Sheet 1 of 2)



DETAIL C



DETAIL D



DETAIL E

- 11. NAS1305 Bolt
- 12. Cover
- 13. Support
- 14. Servo Actuators
- 15. Rigging Tool (T102019)
- 16. Bellcrank
- 17. Control Tubes

- 18. Cyclic Stick Pivot
- 19. Barrel Nut
- 20. Nut
- 21. Washer (Max. 8 Req'd.)
- 22. Barrel Nut
- 23. Friction Adjuster Shaft

CAUTION


REMOVE NAS1305 BOLT AFTER APPLYING MAXIMUM CYCLIC FRICTION

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Figure 27.7. Cyclic controls (Sheet 2 of 2)

20. Install the transmission cowling (Chapter 53).
21. Close the forward fairing (Chapter 53).
22. Install the pilot and copilot seat panel assemblies.
23. Install the pilot and copilot seats (Chapter 25).

67-51. CYCLIC CONTROL STICK LONGITUDINAL BALANCE SPRING — ADJUSTMENT

NOTE

The balance spring is used to keep to a minimum the cyclic control stick mass imbalance forces in the longitudinal control system.

1. Hold the pilot cyclic control stick to the full aft mid lateral position.
2. Adjust the eyebolt (11, Figure 67-10) to get a balance spring (10) dimension as shown for single pilot controls or for dual pilot controls (Detail G).
3. Tighten the jam nut (52) to keep this adjustment.

67-52. CYCLIC CONTROL STICK CENTERING SWITCH

The cyclic control stick centering function makes sure that there is no adverse stress on the main rotor pylon. This system gets an input if the cyclic control stick is off-center when the helicopter is at rest on the ground.

The cyclic control stick centering switch is installed on the pilot cyclic control stick pivot assembly and gives a signal to an annunciator that is installed on the caution/warning/advisory/panel to notify the pilot. This system works only when the full weight of the aircraft is on the landing gear.

When the aircraft is on the ground a switch that is installed on the forward crosstube gets an input of ground contact by the deflection of the crosstube. This switch gives a signal to a light on the display on the caution/warning/advisory panel when the cyclic control stick is not centered.

67-53. CYCLIC CONTROL STICK LATERAL BALANCE SPRING — ADJUSTMENT

NOTE

The balance spring is used to keep the cyclic control stick balanced in the lateral axis.

1. Engage the rigging bolt (40, Figure 67-10) into the hole at the bottom of the pilot cyclic control stick (1) (Detail B).
2. Install the lateral balance spring (53) and adjust the eyebolt (54) to get the dimension shown (Detail D).
3. Tighten the jam nut to keep this adjustment.
4. Remove the rigging bolt (40) from the bottom of the pilot cyclic control stick (1).

67-54. CYCLIC FRICTION

A knob and shaft assembly (4, Figure 67-10) is installed in the pivot support assembly (24) to supply a friction lock for the cyclic control stick. The knob and shaft assembly is turned clockwise or counterclockwise to increase or decrease the force required to move the cyclic control stick.

67-55. CYCLIC FRICTION — CLEANING

1. Remove the cyclic control stick (Paragraph 67-58).
2. Clean the inner surface of the pivot support assembly (24, Figure 67-10) with MEK (C-309, BHT-ALL-SPM) and let it air dry (Detail J).
3. Spray FLUORO-GLIDE onto the inner surface of the pivot support assembly (24). Hold the spray applicator approximately 8 inches (203 mm) away from the surface when the lubricant is applied.
4. Let the FLUORO-GLIDE fully dry.
5. Lightly polish the inner surface of the pivot support assembly (24) with a soft clean cloth.
6. Install the cyclic control stick (Paragraph 67-60).

67-56. CYCLIC FRICTION ADJUSTMENT — MINIMUM FRICTION

1. Connect the hydraulic test stand to the helicopter and turn it on.
2. Adjust the cyclic friction knob (4, Figure 67-10) (Detail J) until a spring scale that is attached to the centre of the cyclic control stick grip (2) shows that a force of 0.5 to 1.5 LBS (0.227 to 0.681 Kg) will move the cyclic control stick (1).
3. After the friction knob (4) is set, tighten the nut (48) by hand (Detail J).

NOTE

You may add a maximum of six washers to align the castellation of the nut for the cotter pin.

4. Safety the nut (48) with a cotter pin (50).
5. Turn off the hydraulic test stand and disconnect it from the helicopter.

67-57. PILOT CYCLIC CONTROL STICK AND GRIP ASSEMBLY

The cyclic control stick extends up and forward from the front of the pilot seat. It is used to put the rotor disk of the main rotor at different angles as the cyclic control stick is moved. The grip is installed on the top end of the cyclic control stick. The grip has switches installed on it for the intercom system, the radio and has provisions for a cargo release and for other kits.

67-58. PILOT CYCLIC CONTROL STICK AND GRIP ASSEMBLY — REMOVAL

1. Remove the pilot seat (Chapter 25).
2. Remove the pilot seat panel assembly.
3. Disconnect the electrical connector at the bottom of the cyclic control stick (1, Figure 67-12).
4. Remove the screws (2) and move the boot assembly (3) up the cyclic control stick (1).

5. Remove the nut (4), washers (5 and 6), spacer (7) and bolt (8) that connect the tube assembly (9) to the pivot assembly (14).

6. Remove the bolt (10), washers (11) and nut (12) that connect the torque tube assembly (13) to the pivot assembly (14). The lateral balance spring (28) will be disconnected as a result of this.

7. Remove the screws (15) and washers (16) that attach the retainer (17) to the pivot support assembly (18).

8. Turn the knob and shaft (19) counterclockwise to loosen the pivot support assembly (18).

CAUTION

DO NOT OPEN THE SLOT OR REMOVE THE OUTER RACE FROM THE SPLIT FRICTION BEARING. IF YOU DO NOT FOLLOW THIS INSTRUCTION, YOU CAN CAUSE DAMAGE TO THE BEARING OR SUPPORT.

9. Remove the pilot cyclic control stick (1) and pivot assembly (14).

10. Remove the screws (20) and washers (21) and cover (22) from the bottom of the flight compartment floor.

11. Remove the bolts (23), washers (24) and pivot support assembly (18).

67-59. PILOT CYCLIC CONTROL STICK AND GRIP ASSEMBLY — INSPECTION AND REPAIR

1. Examine the cyclic control stick (1, Figure 67-12) (Chapter 5).
2. Examine the pivot assembly (14) and the attachments for any cracks or corrosion. Refer to BHT-407-CR&O for the damage limits.
3. Examine the pivot support (18) for any crack or corrosion. Refer to BHT-407-CR&O for the damage limits.

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Calgary, Alberta, T2E 6R7

ORIGINAL DATE: 24 October 2012
REVISION No. 0

CP952

CORRESPONDANCE TO: AERO Design Ltd.
(If other than applicant) 2013 - 39th Ave N.E.
Calgary, Alberta, T2E 6R7

MAKE: Bell
MODEL: 206B, 206L Series, 407

REGISTRATION: All eligible
SERIAL No.: All eligible

NATURE OF WORK: Cyclic Stick Control Friction

TYPE CERTIFICATE DATA SHEET: H-92

MODEL CERTIFICATION BASIS: FAR Part 27, dated 2 October 1964, including amendments 27-1 through 27-30 except as noted (Bell 407)

MODIFICATION CERTIFICATION BASIS: FAR Part 27, dated 2 October 1964, including amendments 27-1 through 27-30 except as noted (Bell 407)

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart B - Flight					
27.29	Empty weight and corresponding C of G	N/A			No change from Type Approved configuration
Subpart D - Design and Construction					
27.601	Design	Use of conventional design		X	
27.603	Materials			X	
27.605(a)	Fabrication Methods			X	
27.607(b)	Fasteners			X	
27.609	Protection of Structure			X	
27.611	Inspection Provisions	No change from Type Approved configuration		X	
27.777	Cockpit Controls	Statement in Report		**	
Subpart G - Operating Limitations and Information					
27.1529	Instructions for Continued Airworthiness	ICA provided	X		
27.1581	Rotorcraft Flight Manual - General	FMS provided	X		
27.1585	Operating Procedures	FMS provided	X		Instructions provided in the existing Flight Manual are applicable without change. Additional instructions on use of friction are provided.

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 952.90{PRIVATE }

CYCLIC FRICTION REPLACEMENT

Bell 206B, 206L Series, 407

Preface

These Instructions for Continued Airworthiness shall be included in the Bell 206B, 206L Series, and/or 407 Maintenance Manual when the Cyclic Friction Replacement is installed in accordance with AERO Design Ltd. Document Control List DCL952, Revision 0, or later approved revision.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0
Date: 25 October 2012

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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0			Original Issue

LIST OF EFFECTIVE PAGES

List of Revisions Revision 0 (Original Issue) 25 October 2012

List of Effective Pages

<u>Title</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	0
Revision Record/List of Effective Pages	2	0
Table of Contents	3	0
00-00-00	4-5	0
04-00-00	6	0
05-00-00	7	0
67-00-00	8-9	0

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 27.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Cyclic Friction Replacement as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness
LH - Left Hand
RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the ~~Quick Release Cargo Basket~~. Requests for a copy may be made in writing to:

AERO Design Ltd.
2013 39th Avenue N.E.
Calgary, Alberta
T2E 6R7
Fax: 403-250-8333
Email: info@aerodesign.ca

cyclic friction replacement

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

Bell 206B helicopters serial numbers 1 through 1657 use a different clamping arrangement for the cyclic friction and are not eligible for this installation.

0-5 GENERAL DESCRIPTION

The cyclic stick control on light Bell helicopters has an adjustable friction device built into the base of the cyclic stick pivot. Two adjustments can be made: a) minimum friction, which is set by the AME, and b) additional friction which can be set by the pilot to suit his preference.

The original design provided by Bell uses different thread pitches on the cyclic friction shaft to provide clamping force on the cyclic stick pivot ball using barrel nuts. Minimum friction is set by the AME at the time of installation and checked periodically with the inspection schedule for the helicopter. There is no way to limit the tightening force that can be applied by the pilot. Excessive tightening causes significant wear on the threads on the shaft and in the barrel nuts.

The new cyclic friction replacement part allows for the minimum friction to be set in exactly the same manner as the original configuration. The additional cyclic friction, applied at the pilot's discretion, is provided by a cam action lever. The cam action provides the mechanical advantage needed to close the gap in the clamp around the cyclic stick pivot ball. Experience with the cam lever arrangement in similar applications shows wear on the mating surfaces is not a significant issue, which will extend the service life of the new part over the original.

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

No additional airworthiness limitations have been imposed due the installation of the Cyclic Friction Replacement.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Inspections are to be carried out in accordance with the schedule and procedures in the existing Maintenance Manual as applicable to the model of helicopter, or other approved program.

Refer to Maintenance Manual, Chapter 5, as follows:

- 206B: BHT-206A/B-MM-1
- 206L: BHT-206L-MM-1
- 206L-1: BHT-206L1-MM-1
- 206L-3: BHT-206L3-MM-1
- 206L-4: BHT-206L3-MM-1
- 407: BHT-407-MM-1

CHAPTER 67 – FLIGHT CONTROLS

67-1 CYCLIC FRICTION REMOVAL

Removal instructions are applicable if the cyclic friction is removed by itself or as part of removing the entire cyclic stick assembly. Refer to Maintenance Manual Chapter 27 (Bell 206L and 260L-1) or Chapter 67 (Bell 206B, 206L-3, 206L-4, 407) for removal instructions of the cyclic stick assembly.

Refer to figure 67.1

1. Remove pilot seat. Refer to Maintenance Manual Chapter 25.
2. Remove pilot seat panel.
3. Place cyclic friction lever in OPEN position (straight out).
4. Remove cotter pin (7), nut (6), washers (04/05), and curved washer (03) from end of cyclic friction.
5. Slide cyclic friction assembly out of cyclic pivot support assembly and out of cyclic stick boot.

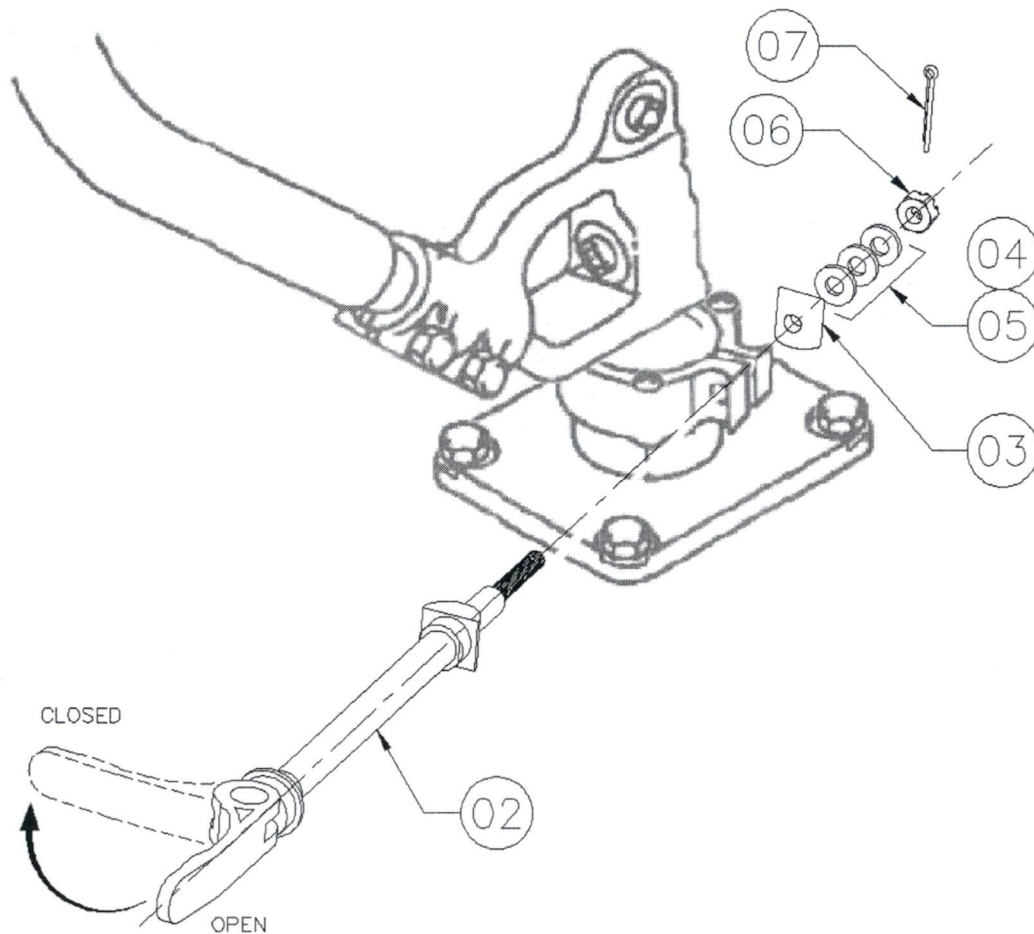


Figure 67.1 – Cyclic Friction Assembly

67-2 CYCLIC FRICTION INSTALLATION

Refer to figure 67.1

1. Remove pilot seat. Refer to Maintenance Manual Chapter 25.
2. Remove pilot seat panel.
3. Slide cyclic friction assembly (02) into cyclic stick boot, seat curved end into cyclic pivot support assembly.
4. Slide curved washer (03) onto threaded end of cyclic friction assembly.
5. Slide NAS1149F0363 (04) and/or NAS1149F0332 (05) washers (as required) onto threaded end of cyclic friction assembly.
6. Thread AN310-3 castellated nut (06) onto threaded end of cyclic friction assembly. Do not tighten.
7. Set minimum friction in accordance with Section 67-3 (below).
8. Safety the AN310-3 castellated nut with MS24665-153 cotter pin (07) in accordance with AC43.13-1B, section 7-127, in the minimum friction position.
9. Install pilot seat panel and pilot seat. Refer to Maintenance Manual Chapter 25.

67-3 CYCLIC FRICTION ADJUSTMENT - MINIMUM FRICTION

1. Set minimum friction with cam lever in OPEN position (straight out) and loose in accordance with the maintenance manual:

206B: BHT-206A/B-MM-8, Section 67-39

206L: BHT-206L-MM-1, Section 27-27A

206L-1: BHT-206L1-MM-1, Section 27-28

206L-3: BHT-206L3-MM-8, Section 67-40

206L-4: BHT-206L3-MM-8, Section 67-40

407: BHT-407-MM-8, Section 67-56

67-4 OPERATING INFORMATION

The pilot may increase friction beyond the minimum ^{as set} ~~seat~~ by rotating the cam lever to the closed position.

To adjust the amount of friction provided by the cam action above the minimum friction:

1. Set cam lever to OPEN position (straight out).
2. Turn lever clockwise to increase friction, counter-clockwise to reduce friction
3. Rotate cam lever to CLOSED position (perpendicular to shaft) to check friction.

CAUTION

If the cam lever points to the upper right (between the 9 o'clock and 12 o'clock position looking aft) when in the CLOSED position, the cam lever may interfere with full motion of the cyclic stick. Do not leave cyclic friction cam lever in this area.

SECTION 2 - NORMAL PROCEDURES

BHT-407-FM-1

TC APPROVED

2-4. INTERIOR AND PRESTART CHECK

1. Cabin interior — Clean, equipment secured.
2. Fire extinguisher — Installed and secured.
3. Cabin loading — Maintain CG within limits.
4. Passenger seat belts — Secured.
5. Copilot seat belt — Secured (if solo).
6. Doors — Secured.
7. Throttle — Closed.
8. LDG LTS switch — OFF.
9. Communications switches — Set.
10. Altimeter — Set.
11. Instruments — Correct indications.
12. Overhead switches — Set:
 - a. BATT switch — OFF.
 - b. GEN switch — OFF.
 - c. PART SEP switch (if installed) — OFF.
 - d. ANTI COLL LT switch — ANTI COLL LT. (on)
 - e. HYD SYS switch — HYD SYS. (on)
 - f. CABIN LT/PASS switch — OFF.
 - g. POS LT switch — As desired.
 - h. DEFOG switch — OFF.
 - i. PITOT HEATER switch — OFF.
 - j. ENG ANTI ICE switch — OFF.
 - k. AVIONICS MASTER switch — OFF.
 - l. HEATER switch (if installed) — OFF.
 - m. INSTR LT rheostat — OFF.
13. Overhead circuit breaker switches — OFF.
14. Overhead circuit breakers — In.
15. Rotor brake handle (if installed) — Up and latched.
16. GPU — Connected (if used).
17. BATT switch — ON for battery start, ON for GPU start, OFF for battery cart start. Observe the following:
 - a. Low rotor audio horn activated.
 - b. For 8 seconds,
 - (1) Trend arcs on LCD instruments indicate full scale.
 - (2) TORQUE and NG digits display 8188.8.
 - (3) MGT and FUEL digits display 8188.8.
 - (4) NR and NP needles move to 107% and 100%, respectively.



28 VDC GPU SHALL BE 500 AMPERES OR LESS TO REDUCE RISK OF STARTER DAMAGE FROM OVERHEATING.

- c. After 3.5 seconds; ENG OUT, FADEC DEGRADE, FADEC FAULT, RESTART FAULT, and ENGINE OVSPD lights illuminate with activation of engine out audio for 3 seconds.
 - d. Sequence repeats (second time).
 - e. ENG OUT light re-illumination with reactivation of engine out audio after 3 seconds (third time).
18. HORN MUTE button — Press to mute.
19. Caution lights — ENG OUT, XMSN OIL PRESS, RPM, HYDRAULIC SYSTEM, GEN FAIL, L/FUEL BOOST, R/FUEL BOOST, L/FUEL XFR, and R/FUEL XFR will be illuminated.

- c. After 3 seconds; ENG OUT, FADEC DEGRADE, FADEC FAULT, RESTART FAULT, and ENGINE OVSPD lights illuminate with activation of engine out audio for 3 seconds.
 - d. ENG OUT light re-illuminates with reactivation of engine out audio, after 3 seconds.
- 18. HORN MUTE button — Press to mute.
 - 19. Caution lights — ENG OUT, XMSN OIL PRESS, RPM, HYDRAULIC SYSTEM, GEN FAIL, L/FUEL BOOST, R/FUEL BOOST, L/FUEL XFR, and R/FUEL XFR will be illuminated.

NOTE

L/FUEL XFR and R/FUEL XFR will not be illuminated when forward fuel tank is empty.

- 20. PEDAL STOP PTT switch annunciator:

Pedals — Centered.

Press — Verify PEDAL STOP caution and ENGAGED annunciator illuminated and left pedal travel restricted.

Release — Verify PEDAL STOP caution and ENGAGED annunciator extinguished and both pedals travel unrestricted.

- 21. Flight controls — Loosen frictions; check travel and verify CYCLIC CENTERING light operation; position for start. Tighten friction as desired.

- 22. Throttle — Check freedom of travel and appropriate operation at OFF, I (idle), FLY and MAX positions. Return throttle to OFF position.

NOTE

With INSTR LT rheostat on and CAUT LT switch positioned to DIM, caution lights are dimmed to a fixed intensity and cannot be adjusted by INSTR LT rheostat.

- 23. INSTR LT rheostat — As desired.
- 24. CAUT LT switch — As desired.
- 25. FUEL BOOST/XFR circuit breaker switches — LEFT (on) and RIGHT (on) and verify all boost and transfer caution lights extinguish.
- 26. FUEL pressure — Check.
- 27. CAUTION LT TEST button — Press to test.
- 28. INSTR CHK button — Press and check for exceedances.
- 29. LCD TEST button — Press to test, if desired.
- 30. FADEC HORN TEST button — Press to test.
- 31. FADEC MODE switch — AUTO.
- 32. FUEL VALVE switch — ON, guard closed, FUEL VALVE light illuminates then extinguishes.
- 33. FUEL QTY — Check TOTAL and FWD tank quantity.

34. OAT/VOLTS display — Check OAT and select VOLTS.

CAUTION

ANY ATTEMPT TO START ENGINE WHEN VOLTAGE IS BELOW 24 VOLTS MAY RESULT IN A HOT START. MONITOR FOR FADEC FAILURE. IF FADEC FAILS (FADEC FAIL WARNING LIGHT), ABORT START BY ROLLING THROTTLE TO CUTOFF AND ENGAGE STARTER TO REDUCE MGT.

2-5. ENGINE START

1. Collective — Full down.
2. Cyclic and pedals — Centered and CYCLIC CENTERING light extinguished.

NOTE

If throttle is positioned in idle for more than 60 seconds, starter latching is disabled and throttle must be repositioned to cut off and then back to idle to enable it for another 60 seconds.

It is recommended that MGT be below 150°C when below 10,000 feet H_P or below 65 °C when above 10,000 feet H_P prior to attempting an engine start. Compliance with this recommendation will allow for cooler starts and reduce potential of reaching hot start abort limits. Refer to DRY MOTORING RUN, paragraph 2-5-A.

3. Throttle — Idle position.
4. START switch — Momentarily press (hold for approximately 1 second) and observe START and AUTO RELIGHT lights are illuminated.
5. MGT — Monitor.

CAUTION

IF MAIN ROTOR IS NOT ROTATING BY 25% NG, ABORT START BY ROLLING THROTTLE TO CUT OFF. ENSURE STARTER HAS DISENGAGED WHEN MGT DECREASES BELOW 150°C.

6. START light — Extinguished at 50% NG (starter has disengaged).
7. AUTO RELIGHT light — Extinguished at 60% NG.
8. ENG and XMSN OIL pressures — Check.

CAUTION

IF ENGINE HAS BEEN SHUT DOWN FOR MORE THAN 15 MINUTES, STABILIZE AT IDLE FOR 1 MINUTE BEFORE INCREASING THROTTLE.

NOTE

During cold temperature operations, normal transmission and engine oil pressure limits may be exceeded during start. Stabilize engine at idle until minimum temperature and pressure limits are attained.

9. Idle — 63 ± 1% NG.
10. BATT switch — ON (if applicable).
11. GPU — Disconnect and close door (if applicable).
12. GEN switch — GEN (on); observe GEN FAIL light extinguishes.

NOTE

Turn generator OFF if ammeter indication drops to zero amps after an initial full scale indication. One reset is allowed. RESET generator and then turn generator back ON (applicable with AMPS/FUEL PSI gauge PN 407-075-024-101 and sub.). Refer to BHT-407-MD-1.

13. Voltmeter — 28.5 ± 0.5 volts.
14. FLIGHT INSTR circuit breaker switches (3) (if installed) — DG, ATT and TURN (on).

NOTE

If dual controls are installed, guard throttle to prevent inadvertent manipulation from co-pilot position.

2-5-A. DRY MOTORING RUN

The following procedure is used to reduce residual MGT to recommended levels for engine start.

1. Throttle — Closed position.
2. START switch — Hold engaged for 15 seconds, then release.

Follow ENGINE START procedure, paragraph 2-5, once 0% NG is indicated.

2-6. SYSTEMS CHECK**2-6-A. PRELIMINARY HYDRAULIC SYSTEMS CHECK****NOTE**

Uncommanded control movement or motoring with hydraulic system off may indicate hydraulic system malfunction.

1. HYD SYS switch — OFF.
2. HYDRAULIC SYSTEM caution light — Illuminated.
3. HYD SYS switch — HYD SYS (on).
4. HYDRAULIC SYSTEM caution light — Extinguished.

2-6-B. FADEC MANUAL CHECK**WARNING**

AUTO TO MANUAL MODE TRANSITIONS WITH NR/NP AT 100% FLAT PITCH CAN RESULT IN RAPID NR/NP ACCELERATION IN APPROXIMATELY 7 SECONDS. TO AVOID POSSIBLE OVERSPEED CONDITION, PERFORM THE FOLLOWING CHECK AT IDLE (63% NG).

1. Throttle — Idle (63% NG).
2. FADEC MODE switch — MAN.
3. FADEC MANUAL and AUTO RELIGHT lights — Illuminated.
4. Check NG stabilized at 75% or less.
5. Throttle — Increase slowly to ensure engine responds, then return to idle.
6. FADEC MODE switch - AUTO.
7. FADEC MANUAL and AUTO RELIGHT lights — Extinguished.

2-6-C. ENGINE RUNUP

1. Throttle — Increase smoothly to FLY detent position. Check RPM warning light extinguished at 95% NR.
2. NR and NP needles — Check matching and indicating 100%.

NOTE

Overhead circuit breakers highlighted with arrow graphic ; are powered through AVIONICS MASTER switch.

3. AVIONICS MASTER switch — AVIONICS MASTER (on).

4. ELT (if installed) — Check for inadvertent transmission.
5. Flight controls — Check freedom with minimum friction.
6. ENG ANTI ICE switch — ENG ANTI ICE (on); check for MGT increase and illumination of ENGINE ANTI-ICE light (if installed).
7. ENG ANTI ICE switch — OFF; check MGT returns to normal and ENGINE ANTI-ICE light (if installed) extinguishes; then ENG ANTI ICE (on) if required.

NOTE

If temperature is below 5°C (40°F) and visible moisture is present, ENG ANTI ICE shall be on.

8. PART SEP switch (if installed) — As required.

2-6-D. HYDRAULIC SYSTEMS CHECK

NOTE

Hydraulic systems check is to determine proper operation of hydraulic actuators for each flight control system. If abnormal forces, unequal forces, control binding, or motoring are encountered, it may be an indication of a malfunctioning flight control actuator.

1. Collective — Full down.
2. NR — 100% RPM.
3. HYD SYS switch — OFF.
4. HYDRAULIC SYSTEM caution light — Illuminated.

5. Cyclic — Centered.
6. Cyclic control — Check normal operation by moving cyclic forward and aft, then left and right (approximately 1 inch). Center cyclic.
7. Collective — Check normal operation by increasing collective slightly (1 to 2 inches). Repeat two to three times as required. Return to full down position.
8. Pedals — Check normal operation by displacing pedals slightly (1 inch).
9. HYD SYS switch — HYD SYS (on).
10. HYDRAULIC SYSTEM caution light — Extinguished.
11. Cyclic and collective friction — Set as desired.

2-7. BEFORE TAKEOFF

1. ENG ANTI ICE switch — As required.
2. Light switches — As required.
3. INSTR LT rheostat — As desired.

NOTE

For night flight, it is recommended to point the map light at the flight instruments and set to a low intensity. Sufficient night lighting will be provided in the event of an instrument lighting failure.

4. Radio(s) — Check as required.
5. Flight controls — Position and adjust frictions for takeoff.

CAUTION

FAILURE TO POSITION AND MAINTAIN THROTTLE IN FLY DETENT POSITION PRIOR TO TAKEOFF AND DURING NORMAL FLIGHT OPERATIONS CAN LIMIT AVAILABLE ENGINE POWER.

6. Throttle — Open to FLY detent position. Check 99 to 100% NR/NP.
7. Engine, transmission, and electrical instruments — Within limits.
8. Flight and navigation instruments — Check.
9. FUEL QTY — Note indication.
10. FUEL QTY FWD TANK button — Press, note fuel remaining in forward cell.

2-8. TAKEOFF

1. Rear facing seat headrests — Adjusted to proper position.

NOTE

During takeoffs disregard CYCLIC CENTERING light and position cyclic as required.

2. Collective — Increase to hover.
3. Directional control — As required to maintain desired heading.
4. Cyclic — Apply as required to accelerate smoothly.
5. Increase collective, up to 5% torque above hover power, to obtain desired rate of climb and airspeed. Once clear of the HV diagram shaded areas, adjust power and airspeed as desired.
6. PEDAL STOP PTT switch — Check ENGAGED annunciator illuminated above 55 ± 5 KIAS.

2-9. IN-FLIGHT OPERATIONS

1. AIRSPEED — As desired (not to exceed V_{NE} at flight altitude).

CAUTION

AT HIGH POWER AND HIGH AIRSPEED, CYCLIC ONLY ACCELERATIONS AND MANEUVERING MAY SIGNIFICANTLY INCREASE MGT AND TORQUE WITH NO COLLECTIVE INPUT. THIS INCREASE IS MORE RAPID AT LOWER OAT.

NOTE

Pilot shall keep feet on tail rotor pedals at all times. Do not press PEDAL STOP PTT switch in flight.

2. PEDAL STOP PTT switch — Check ENGAGED annunciator illuminated above 55 ± 5 KIAS.
3. ENG ANTI ICE and PITOT HEATER switches — ENG ANTI ICE and PITOT HEATER switches on in visible moisture when ambient temperature is at or below 5°C (40°F).
4. PITOT HEATER — confirm operation (increase ammeter load).

NOTE

When ENG ANTI ICE switch is in ENG ANTI ICE (on), MGT will increase. Monitor MGT when selecting ENG ANTI ICE at high power settings.

5. Altimeter — Within limits.
6. FUEL QTY FWD TANK button — Press, note forward fuel tank indication.

NOTE

Full forward fuel tank quantity (approximately 256 pounds) will be indicated at approximately 770 pounds or greater total fuel. Fuel transfer will be complete at approximately 185 pounds total fuel.

2-10. DESCENT AND LANDING**NOTE**

Large reductions in collective pitch at heavy GW may permit NR to increase independent of NP (needles split). Main rotor may be reengaged with a smooth increase in collective pitch.

1. Rear facing seat headrests — Adjusted to proper position.
2. Flight controls — Adjust friction as desired.
3. Throttle — Fly detent position. Check 99 to 100% NP.
4. Flight path — As required for type of approach.
5. ENG ANTI ICE — As required.
6. LDG LTS switch — As desired.

NOTE

During run-on or slope landings disregard CYCLIC CENTERING light and position cyclic as required. After landing is completed and collective is full down, reposition cyclic so that CYCLIC CENTERING light is extinguished.

7. PEDAL STOP PTT switch — Check ENGAGED annunciator extinguished below 50 ± 5 KIAS.

2-11. ENGINE SHUTDOWN

1. Collective — Full down.
2. Cyclic and pedals — Centered and CYCLIC CENTERING light extinguished.
3. Cyclic friction — Increase so that cyclic maintains centered position.
4. LDG LTS switch — OFF.
5. Throttle — Reduce to idle stop. Check RPM warning light illuminated and audio on at 95% NR.

NOTE

If dual controls are installed, guard throttle to prevent inadvertent manipulation from co-pilot position.

6. HORN MUTE button — Press to mute.
7. MGT — Stabilize at idle for 2 minutes.
8. ENG ANTI ICE switch — OFF.
9. FLIGHT INSTR circuit breakers switches (if installed) — OFF
10. FUEL BOOST/XFR LEFT circuit breaker switch — OFF.

NOTE

Left fuel boost and transfer pumps will continue to operate until either LEFT FUEL BOOST/XFR circuit breaker switch (highlighted with yellow border) or FUEL VALVE switch is positioned to OFF. These pumps operate directly from battery and will not be deactivated when BATT switch is OFF. Battery power will be depleted if both switches remain on.

11. ELT (if installed) — Check for inadvertent transmission.
12. AVIONICS MASTER switch — OFF.
13. GEN switch — OFF.
14. OVSPD TEST button — If required; press, hold 1 second, and release.

NOTE

Overspeed shut down test should be accomplished on first engine shut down of the day. ENGINE OVSPD light will momentarily illuminate in addition to those lights that illuminate during a normal shut down.

15. IDLE REL switch — Press and hold.

CAUTION

POSITIONING THROTTLE OUT OF CUT-OFF DURING NG SPOOL DOWN MAY CAUSE POST ENGINE SHUTDOWN FIRE.

16. Throttle — Closed; check MGT and NG decreasing, ENGINE OUT warning light illuminated and audio on at $55 \pm 1\%$.
17. HORN MUTE button — Press to mute.

CAUTION

AVOID RAPID ENGAGEMENT OF ROTOR BRAKE IF HELICOPTER IS ON ICE OR OTHER SLIPPERY OR LOOSE SURFACE TO PREVENT ROTATION OF HELICOPTER.

18. Rotor brake (if installed) — Apply full rotor brake at or below 40% NR. Return rotor brake handle to stowed position just prior to main rotor stopping.

19. FUEL VALVE switch — OFF.

CAUTION

DO NOT INCREASE COLLECTIVE OR APPLY LEFT TAIL ROTOR PEDAL TO SLOW ROTOR DURING COAST DOWN.

20. Pilot — Remain on flight controls until rotor has come to a complete stop.
21. All overhead switches, except HYD SYS switch — OFF.

NOTE

Ensure engine rotation has completely stopped prior to positioning BATT switch to OFF.

22. BATT switch — OFF, with NG at 0%.

CAUTION

APPLICABLE MAINTENANCE ACTION MUST BE PERFORMED PRIOR TO FURTHER FLIGHT IF A FADEC LIGHT HAS ILLUMINATED DURING THE PREVIOUS FLIGHT OR ON ENGINE SHUTDOWN.

NOTE

If shutting down at, or refueling to, between approximately 185 to 210 pounds total fuel quantity, up to 18 pounds of fuel may remain in forward fuel cell as unusable.

2-12. POSTFLIGHT CHECK

If any of following conditions exist:

- Thunderstorms are in local area or forecasted.
- Winds in excess of 35 knots or a gust spread of 15 knots exists or is forecasted.
- Helicopter is parked within 150 feet of hovering or taxiing aircraft that are in excess of basic GW of helicopter.
- Helicopter to be left unattended.

Perform following:

1. Install main rotor blade tiedowns.
2. Secure tail rotor loosely to tailboom with tiedown strap to prevent excessive flapping.
3. Install exhaust cover, engine inlet protective plugs and pitot cover.

NOTE

Refer to BHT-407-MD-1 for additional tiedown data.

Cam Lever

82/ASS



0.285/0.290 dia.

- $\phi 0.125$

- 0.313

Bushing
95230-01

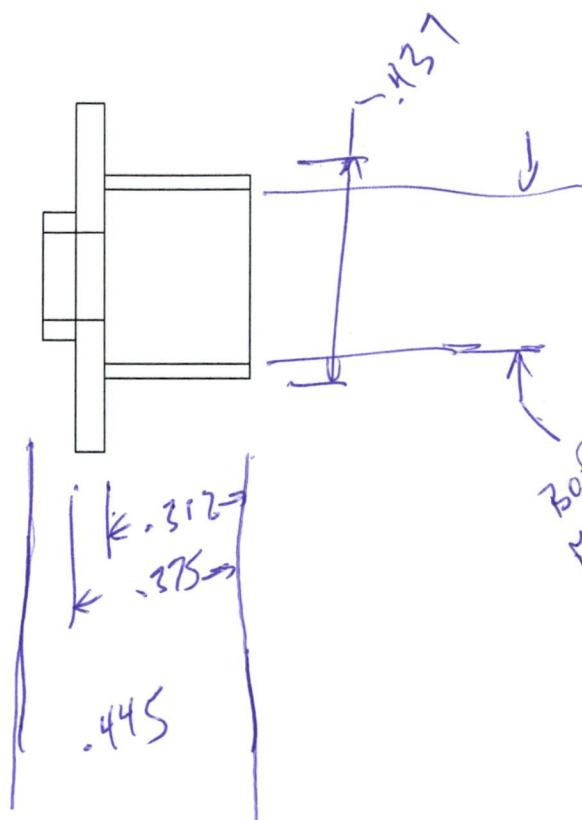
95228-01

✓ Nylon

4 1/2" stock

95222-0

$.250^{+0}_{-0.01}$



BORE 0.376
MED PRESS FIT
WITH 1/8" O.D. TUBE
ON ASSY

RADIUS CORNERS 0.030 - 0.015

095211.NC

%
095211
(BELL 206B - CONTROL LOCK TUBE END)
(OUTWARD TUBE END PLUG, PART NO. 95210-11)

(G54 X0 SPINDLE AXIS, Z0 -0.015 FROM RAW STOCK END)
(STICK-OUT 1.375 INCH)

(T01 - TRIANGULAR INSERT IN GANG HOLDER)
(T02 - PART POSITIONING REVOLVING STOP)
(T03 - CENTRE DRILL)
(T04 - 5/16" DIA. END MILL)
(T05 - NO. 9 DRILL)
(T06 - BORING BAR)
(T07 - PARTING TOOL - REVERSE DIRECTION)

G18 G20 G40 G80 G97 G99
G50 S4500 (SPINDLE SPEED CLAMP)

(POSITION STOCK STOP OUT OF WAY)

T202
G00 Z0.75

(Face stock)
(T01 - TRIANGULAR INSERT IN GANG HOLDER)

G54 T101
G99 S3000 M03
G00 X0.63
Z0.1
X0.63 Z0.
M08
G01 X-0.02 Z0. F0.003

G00 Z1.

(centre drill)
(T03 - CENTRE DRILL)

G54 T303
G00 X0.
Z0.05
S3000 M03
M08
G98 G81 Z-0.23 R0.005 F2.

095211.NC

G80 G00 Z1.75

(drill #9)
(T05 - NO. 9 DRILL)

G54 T505
G00 X0.
Z0.05
S1500 M03
M08
G98 G83 Z-0.525 R0. Q0.1 F2.

G80 G00 Z0.5

(profile part)
(T01 - TRIANGULAR INSERT IN GANG HOLDER)

G54 T101
G99 S3000 M03
G00 X0.63
Z0.1
M08
G99 G01 X0.594 F0.003
Z-0.31
X0.63
G00 Z0.1
X0.563
G01 Z-0.31

X0.63
G00 Z0.1
X0.531
G01 Z-0.31

X0.63
G00 Z0.1
X0.5
G01 Z-0.31

X0.63
G00 Z0.1
X0.468
G01 Z-0.31

X0.63
G00 Z0.1
X0.448
G01 Z-0.31

X0.63
G00 Z0.1
X0.

O95211.NC

Z0.
G01 X0.437 ,R0.045 F0.002
Z-0.311
X0.62 ,R0.045
X0.62 Z-0.56
X0.63

G00 Z1.5

(bore with 5/16" end mill?)
(T04 - 5/16" DIA. END MILL)

T404
G54 G00 X0.
Z0.1
S1500 M03
M08
G99 G89 F0.003 Z-0.312 R0.1 P1.

G80 G00 Z3.

(bore to size with boring bar)
(ADJUST FINAL CUT X DIM TO GET PRESS FIT - EACH SETUP)
(USE TOOL WEAR FOR ADJUSTMENT)

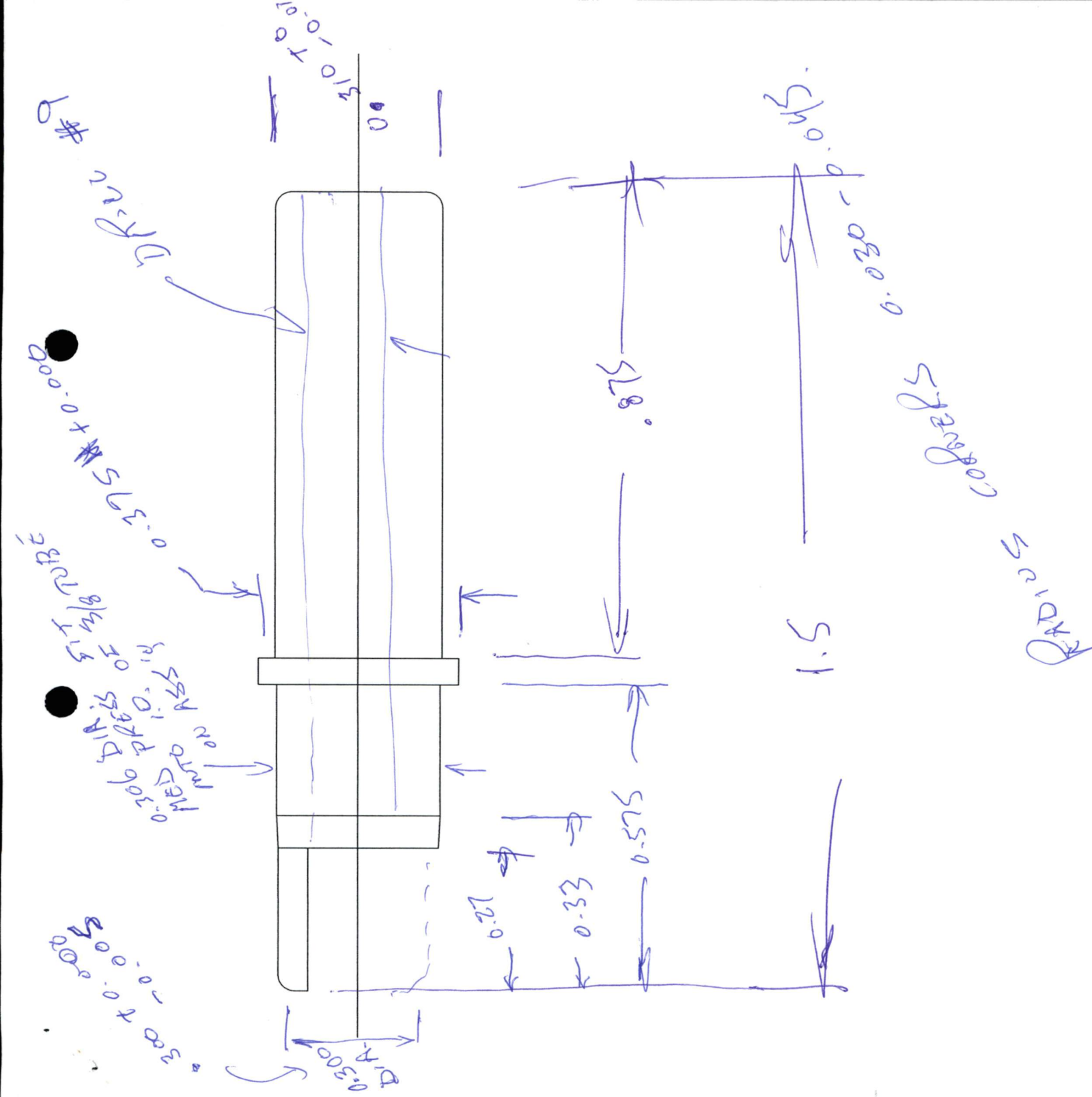
(T06 - BORING BAR)

T606
G54 G00 X0.3
Z0.1

X0.31
S2000 M03
Z0.02
M08
G90 G99 Z-0.32 U0.01 F0.002
X0.33
X0.34
X0.35
X0.36
X0.37
X0.375
X0.376

G80 G00 Z2.5

(PART OFF PIECE)



095216.NC

.310 X .875
END

%
095216
(BELL 206B - CONTROL LOCK TUBE END)
(INWARD TUBE END PLUG, PART NO. 95210-16)
(OPERATION 1)
(OPERATION 2 - PRGM 095217 REQ'D AFTER 095216 TO COMPLETE PART)
(G54 X0 IS Spindle axis, Z0 is -0.015" FROM RAW MAT'L END)
(MATERIAL: 3/8" DIA. 304SS ROD)

(**** MIN STICK-OUT IS 1.75)

(T01 - TRIANGULAR INSERT IN GANG HOLDER)
(T02 - PART SETTING STOP)
(T03 - CENTRE DRILL)
(T04 -)
(T05 - NO. 9 DRILL)
(T06 -)
(T07 - PART OFF TOOL - FORWARD SPINDLE DIRECTION)

G18 G20 G40 G80 G97 G99
G50 S4500 (SPINDLE SPEED CLAMP)

T202
G00 Z1.5

(Face stock)

G54 T101
G99 S3000 M03
G00 X0.4
Z0.1
X0.4 Z0.
M08
G01 X-0.02 Z0. F0.003
(M09)
G00 Z2.

(centre drill)

G54 T303
G00 X0.
Z0.05
S2500 M03
M08
G98 G81 Z-0.275 R0.005 F2.
(M09)
G80 G00 Z2.

(drill #9)

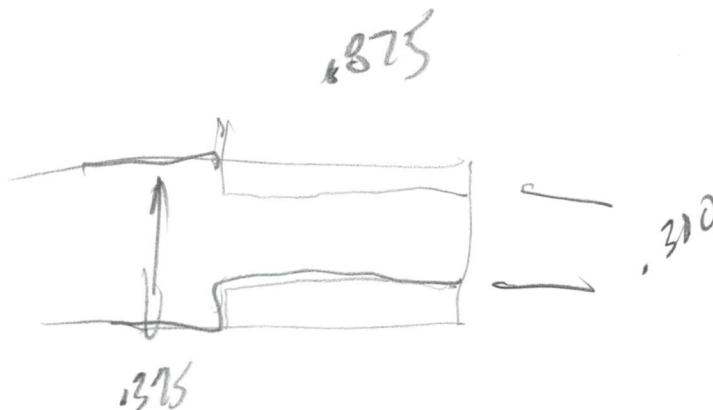
O95216.NC

G54 T505
G00 X0.
Z0.05
S1000 M03
M08
G98 G83 Z-1.585 R0.05 Q0.1 F2.
(M09)
G80 G00 Z2.

(profile part)

G54 T101
G99 S3000 M03
G00 X0.4
Z0.1
M08
X0.35
G99 G90 Z-0.875 F0.003
X0.32

G99 G01 Z0. F0.002
X-0.02
X0.31 ,R0.045
Z-0.875
X0.375 ,R0.02
Z-1.
X0.4
(M09)
G80 G00 Z3.



(PART OFF PIECE)

G54 T707 (PARTING TOOL FROM BACK SIDE - SPINDLE FORWARD DIRECTION)
S2000 M03 (SPINDLE FORWARD)
G00 X-0.45

M08
Z-1.509
G99 G01 X0.03 F0.0005
G01 X-0.45 F0.01
M05
M09
G00 Z2.

G54 G99
T202
G00 X0.
Z0.01

M30
%

O95217.NC

%

O95217

(BELL 206B - CONTROL LOCK TUBE END)

(INWARD TUBE END PLUG, PART NO. 95210-16)

(OPERATION 2 - PRGM 095216 IS PREREQUISITE)

(G54 X0 IS spindle axis,)

(Z0 is -0.009 FROM FINISH END OF 095216)

(MATERIAL: PART FROM 95216)

(M/C SHOULDER FROM 095216 MIN. 1/8" OUT FROM COLLET)

(STOP IS IN COLLET ALLOWING THE MIN 1/8" CLEARANCE WITH COLLET)

(NO STOP TOOL IN T202)

(T01 - TRIANGULAR INSERT IN GANG HOLDER)

(T02 -)

(T03 - 1/4 DIA. CENTRE DRILL)

(T04 -)

(T05 -)

(T06 -)

(T07 -)

G18 G20 G40 G80 G97 G99

G50 S4500 (SPINDLE SPEED CLAMP)

(profile part)

G54 T101

G99 S3000 M03

G00 X0.4

Z0.1

M08

X0.35

G99 G90 Z-0.575 F0.003

X0.32

G99 G01 Z0. F0.002

X-0.02

X0.3 ,R0.035

Z-0.27

X0.306 Z-0.33

Z-0.575

X0.375 ,R0.02

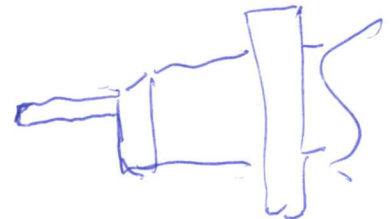
Z-0.63

X0.4

M09

G80 G00 Z3.

(centre drill TO DEBURR HOLE)

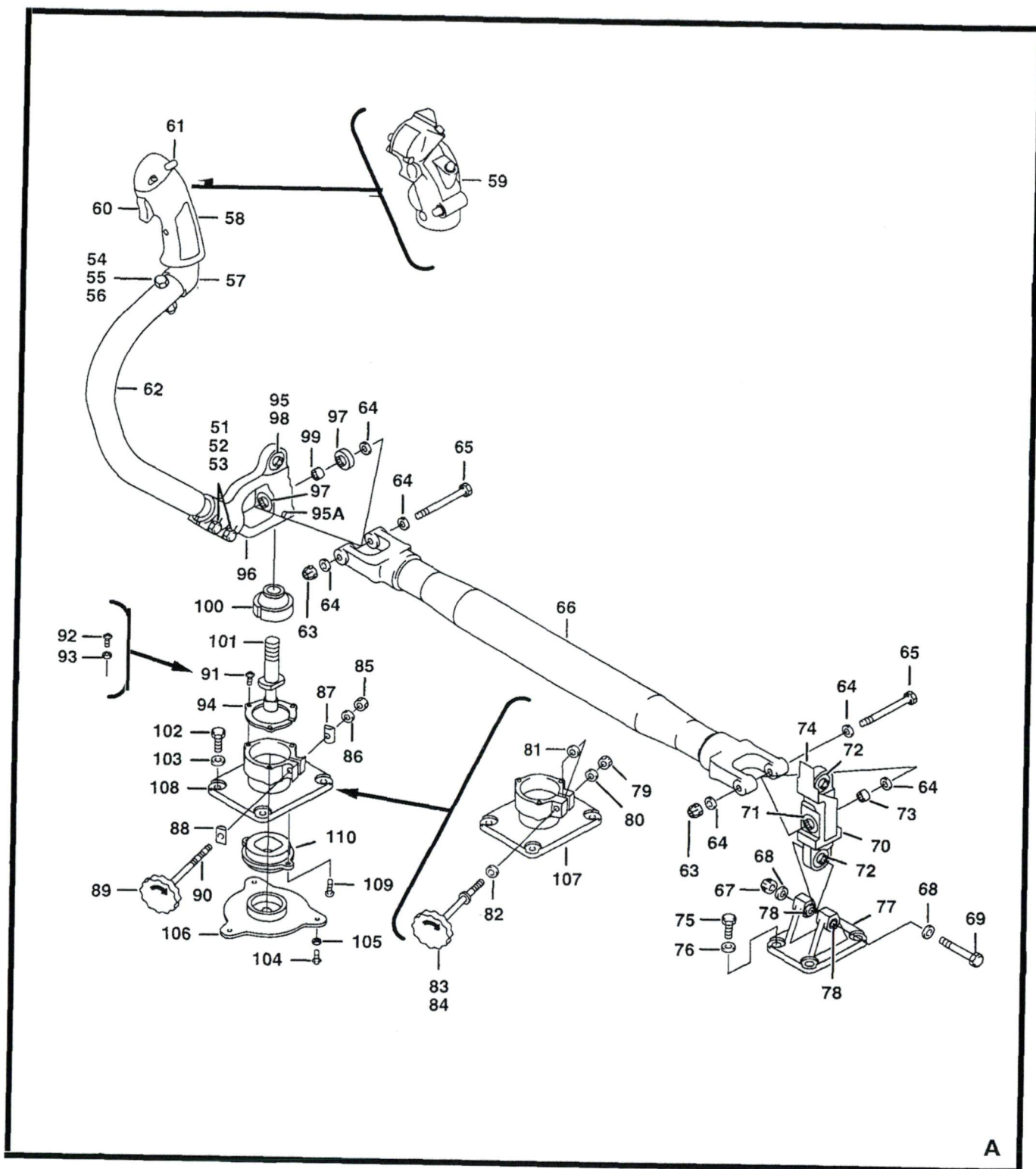


095217.NC

G54 T303
G00 X0.
Z-0.2
S2500 M03
M08
G98 G81 Z-0.26 R-0.2 F4.
M09
G80 G00 Z3.

M30

%



206A/B/B3-67-1005-2
C0000

Figure 67-5. Controls installation, cyclic (Sheet 2)

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67-99-00
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FOR BEST VALUE, BUY GENUINE BELL PARTS

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic			
	206-001-011-001	CONTROLS INSTL, CYCLIC	1		
	206-001-011-003	CONTROLS INSTL, CYCLIC	1		
	206-001-011-005	CONTROLS INSTL, CYCLIC	1		
	206-001-011-007	CONTROLS INSTL, CYCLIC	1		
	206-001-011-009	CONTROLS INSTL, CYCLIC	1		
	206-001-011-011	CONTROLS INSTL, CYCLIC	1		
	206-001-011-013	CONTROLS INSTL, CYCLIC	1		
	206-001-011-017	CONTROLS INSTL, CYCLIC	1		
	206-001-011-023	CONTROLS INSTL, CYCLIC	1		
	206-001-011-101	CONTROLS INSTL, CYCLIC	1		
	206-001-011-103	CONTROLS INSTL, CYCLIC	1		
1	MS17825-4	.NUT (REPLACED BY MS14144L4)	2	0	
1	MS14144L4	.NUT (REPLACES MS17825-4)	2	1	
2	NAS1197-416	.WASHER	2	1	M
2	AN960PD416	.WASHER (REPLACED BY AN960JD416)	2		Y
2	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	2		Y
2	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	2		Y
3	NAS334C13	.BOLT	2	1	M
3	NAS334CP11	.BOLT	2	1	Y
4	MS17825-4	.NUT (REPLACED BY MS14144L4)	2	0	
4	MS14144L4	.NUT (REPLACES MS17825-4)	2	1	
5	AN960-416L	.WASHER (REPLACED BY NAS1149F0432P)	2	1	
5	NAS1149F0432P	.WASHER (REPLACES AN960-416L)	2		
6	AN174-10	.BOLT	2	1	
7	206-001-022-043	.TUBE ASSY, ADJUSTABLE FLIGHT CONTROLS	2		G
7	206-001-096-037	.TUBE ASSY, ADJUSTABLE FLIGHT CONTROLS (REPLACED . BY 206-001-096-001)	2	0	W
7	206-001-096-001	.TUBE ASSY, ADJUSTABLE FLIGHT CONTROLS (REPLACES . 206-001-096-037)	2	1	W
8	206-001-052-001	..BEARING, PLAIN, ROD END	1	1	
9	AN316-6R	..NUT	1	1	
10	AN960PD616	..WASHER (REPLACED BY AN960JD616)	1		
10	AN960JD616	..WASHER (REPLACES AN960PD616) (REPLACED BY NAS1149D0663J)	1		
10	NAS1149D0663J	..WASHER (REPLACES AN960JD616)	1		
11	206-001-022-045	..TUBE ASSY, ADJUSTABLE FLIGHT CONTROLS (USBL ON . . 206-001-022-043)	2		G
11	206-001-096-039	..TUBE ASSY, ADJUSTABLE FLIGHT CONTROLS (USBL ON . . 206-001-096-037)	1		W
11	206-001-096-003	..TUBE ASSY, ADJUSTABLE FLIGHT CONTROLS (USBL ON . . 206-001-096-001)	1	6	W
12	206-001-055-001	...BEARING, PLAIN ROD END (USBL ON 206-001-096-039, 206-001-022-045)	1	1	
12	209-001-053-001	...BEARING, PLAIN, ROD END (USBL ON 206-001-096-003)	1	1	
13	214-001-024-001	...INSERT	1	1	
14	MS17825-5	.NUT (REPLACED BY MS14144L5)	1		
14	MS14144L5	.NUT (REPLACES MS17825-5)	1	1	
15	AN960PD516	.WASHER (REPLACED BY AN960JD516)	2		

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic (Cont'd)			
15	AN960JD516	.WASHER (REPLACES AN960PD516) (REPLACED BY NAS1149D0563J)	2	1	
15	NAS1149D0563J	.WASHER (REPLACES AN960JD516)	2	1	
16	AN175-17	.BOLT (ALTERNATE PART)	1	1	
16	20-057-5-23D	.BOLT	1	1	
17	MS17825-4	.NUT (REPLACED BY MS14144L4)	1	0	
17	MS14144L4	.NUT (REPLACES MS17825-4)	1	1	
18	NAS1197-416	.WASHER	2	1	
19	AN174-13	.BOLT	1	1	
20	206-001-363-001	.LEVER ASSY, MIXING	1		C
20	206-001-363-009	.LEVER ASSY, MIXING	1	1	R
21	MS17825-4	.NUT (REPLACED BY MS14144L4)	3	0	
21	MS14144L4	.NUT (REPLACES MS17825-4)	3	1	
22	120-003-16-9	.SHIM	3	1	
23	206-001-065-001	.WASHER, THRUST (USBL ON 206-001-363-001)	3	0	C
24	206-001-067-003	.WASHER, SLOTTED THRUST (USBL ON 206-001-363-009)	3	1	R
25	206-001-062-003	.WASHER, THRUST	3	1	
26	206-001-061-001	.CLEVIS (USBL ON 206-001-363-001)	2	0	C
26	206-001-061-003	.CLEVIS (USBL ON 206-001-363-009)	2	1	R
27	206-001-057-001	.BEARING (USBL ON 206-001-363-001)	1	0	C
27	206-001-057-003	.BEARING (USBL ON 206-001-363-009)	1	1	R
28	206-001-363-005	.LEVER ASSY	1	1	
29	06DU08	.BUSHING	3	1	
30	NAS679A4	.NUT (REPLACED BY MS21042L4)	2	0	
30	MS21042L4	.NUT (REPLACES NAS679A4)	2	1	
31	NAS1197-416	.WASHER	4	1	
32	AN4-17A	.BOLT	1	1	
33	AN4-30A	.BOLT	1	1	
34	MS17825-5	.NUT (REPLACED BY MS14144L5)	2		
34	MS14144L5	.NUT (REPLACES MS17825-5)	2	1	
35	NAS1197-516	.WASHER	3	1	
36	206-001-391-001	.CLIP	1		K
37	NAS1197-516	.WASHER	1	1	P
38	AN175-16	.BOLT	1	1	H
38	NAS1305-22D	.BOLT (REPLACED BY NAS6605D22)	1		X
38	NAS6605D22	.BOLT (REPLACES NAS1305-22D)	1		X
39	AN175-16	.BOLT	1	1	D
40	206-001-380-001	.EYEBOLT	1	1	T
41	206-001-322-003	.YOKE, LH	1	1	
42	206-001-323-001	.YOKE, RH	1	1	
43	206-001-377-001	.SPRING	1	1	S
44	NAS679A3	.NUT (REPLACED BY MS21042L3)	1		S
44	MS21042L3	.NUT (REPLACES NAS679A3)	1	1	S
45	AN960PD10L	.WASHER (REPLACED BY AN960JD10L)	2		S
45	AN960JD10L	.WASHER (REPLACES AN960PD10L) (REPLACED BY NAS1149D0332J)	2		S
45	NAS1149D0332J	.WASHER (REPLACES AN960JD10L)	2		S
46	NAS671-10	.NUT	1	1	S

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic (Cont'd)			
47	206-001-745-001	.EYEBOLT ASSY	1	1	J
47	206-001-745-003	.EYEBOLT ASSY	1	1	V
48	AN3-3A	.BOLT	2	1	S
49	AN960PD10	.WASHER (REPLACED BY AN960JD10)	2		S
49	AN960JD10	.WASHER (REPLACES AN960PD10) (REPLACED BY NAS1149D0363J)	2		S
49	NAS1149D0363J	.WASHER (REPLACES AN960JD10)	2		S
50	206-001-379-001	.BRACKET ASSY	1	1	J
50	206-001-375-001	.BRACKET ASSY	1	1	V
51	MS21042L4	.NUT	2	1	
52	AN960PD416	.WASHER (REPLACED BY AN960JD416)	4		
52	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	4		
52	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	4		
53	AN4-21A	.BOLT	2	1	
	206-001-344-001	.STICK ASSY, CYCLIC	1	0	N
	206-001-344-101	.STICK ASSY, CYCLIC	1		Z
54	90-003-40	.NUT	1	1	
55	AN960PD416	.WASHER (REPLACED BY AN960JD416)	3		
55	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	3		
55	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	3		
56	AN24-26A	.BOLT	1	1	
57	206-001-343-001	.ELBOW	1		
58	206-001-359-001	.GRIP ASSY (ALTERNATE PART)	1	1	
59	21110-1	.GRIP ASSY (SEE FIG. 10 FOR BREAKDOWN) (REPLACED . BY PM21110-1)	1	0	
59	PM21110-1	.GRIP ASSY (SEE FIG. 10 FOR BREAKDOWN) (REPLACES . 21110-1)	1	6	
60	90-367	...SWITCH (USBL ON 206-001-359-001)	1	1	
61	90-370	...SWITCH (USBL ON 206-001-359-001)	1	1	
62	206-001-342-001	.TUBE ASSY, CYCLIC STICK	1	1	N
62	206-001-342-101	.TUBE ASSY, CYCLIC STICK	1	1	Z
63	MS17825-4	.NUT (REPLACED BY MS14144L4)	2	0	
63	MS14144L4	.NUT (REPLACES MS17825-4)	2	1	
64	AN960PD416	.WASHER (REPLACED BY AN960JD416)	6		
64	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	6		
64	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	6		
65	AN174-30	.BOLT	2	1	
66	206-001-306-011	.TUBE ASSY, TORQUE	1	1	
67	MS17826-5	.NUT (REPLACED BY MS14145L5)	1	0	
67	MS14145L5	.NUT (REPLACES MS17826-5)	1	1	
68	NAS1197-516	.WASHER	2	1	
69	AN175-21	.BOLT	1	1	
70	206-001-339-011	.LEVER ASSY	1	0	A
70	206-001-339-027	.LEVER ASSY	1	6	E
70	206-001-339-023	.LEVER ASSY (REPLACED BY 206-001-400-009 AND -115)	1	0	Q

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic (Cont'd)			
70	206-001-400-009	.LEVER ASSY (REPLACES 206-001-339-023) (REPLACED BY 206-001-400-115)	1		Q
70	206-001-400-115	.LEVER ASSY (REPLACES 206-001-339-023 AND 206-001-400-009)	1	1	Q
71	MS20200KP4	..BEARING (REPLACED BY MS27640-4)	2	0	
71	MS27640-4	..BEARING (REPLACES MS20200KP4)	2	1	
72	206-001-053-003	..BEARING (USBL ON 206-001-339-011 AND -027)	2	0	AE
72	206-001-053-005	..BEARING (USBL ON 206-001-339-023, 206-001-400-009 AND -115) (REPLACED BY 206-301-051-101)	2	1	Q
72	206-301-051-101	..BEARING (USBL ON 206-001-339-023, 206-001-400-009 AND -115) (REPLACES 206-001-053-005)	2	1	Q
73	214-001-339-009	..SPACER (USBL ON 206-001-339-023)	1		Q
73	214-001-905-013	..SPACER (USBL ON 206-001-400-009 AND -115)	1	1	Q
74	206-001-340-001	..SHIELD	1	6	
75	AN4-5A	.BOLT	4	1	
76	NAS1197-416	.WASHER	4	1	
77	206-001-330-001	.SUPPORT ASSY, PIVOT	1	1	
78	85B7-19-31-18	..BUSHING (REPLACED BY 22-007-19-31-18)	2		
78	22-007-19-31-18	..BUSHING (REPLACES 85B7-19-31-18)	2	1	
79	MS17826-4	.NUT (REPLACED BY MS14145L4)	1		C
79	MS14145L4	.NUT (REPLACES MS17826-4)	1	1	C
80	120-035-16-8	.SHIM	1	1	C
81	50Z16-9-1	.SPACER	1	1	C
82	AN960PD416	.WASHER (REPLACED BY AN960JD416)	1		C
82	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	1		C
82	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	1		C
83	206-001-336-005	.KNOB AND SHAFT ASSY	1		C
84	206-001-335-001	..KNOB	1	1	C
85	206-001-351-001	.NUT	1	1	R
86	AN960PD416	.WASHER (REPLACED BY AN960JD416)	1		R
86	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	1		R
86	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	1		R
87	SL50-4ASP5	.NUT, BARREL	1	1	U
88	SL50-5ASP6	.NUT, BARREL	1	1	U
	206-001-348-001	.KNOB AND SHAFT ASSY	1		L
	206-001-396-001	.SHAFT ASSY	1	1	U
89	206-001-335-001	..KNOB	1	1	
90	206-001-325-001	..SHAFT (USBL ON 206-001-348-001)	1	1	L
90	206-001-395-001	..SHAFT (USBL ON 206-001-396-001)	1	1	U
91	AN525-10R6	.SCREW	3	1	R
92	AN525-10R6	.SCREW	3	1	C
93	AN960PD10L	.WASHER (REPLACED BY AN960JD10L)	3		C
93	AN960JD10L	.WASHER (REPLACES AN960PD10L) (REPLACED BY NAS1149D0332J)	3		C
93	NAS1149D0332J	.WASHER (REPLACES AN960JD10L)	3		C
94	206-001-349-001	.RETAINER	1	1	R

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic (Cont'd)			
95	206-001-345-001	.PIVOT ASSY, PILOTS (REPLACED BY 206-001-345-003)	1	0	B
95	206-001-345-003	.PIVOT ASSY, PILOTS (REPLACES 206-001-345-001) . . . (REPLACED BY 206-001-345-007)	1		F
95	206-001-345-007	.PIVOT ASSY, PILOTS (REPLACES 206-001-345-001 . . . AND -003) (REPLACED BY 206-001-345-009)	1	6	N
95	206-001-345-009	.PIVOT ASSY, PILOTS (REPLACES 206-001-345-001, . . . -003 AND -007)	1	1	
95A	MS20470AD4	..RIVET (NOTE 1)	1		
96	206-001-339-005	..LEVER ASSY, PILOTS (USBL ON 206-001-345-001) . . . (REPLACED BY 206-001-339-019 AND -033)	1		B
96	206-001-339-019	..LEVER ASSY, PILOTS (USBL ON 206-001-345-001 . . . AND -003) (REPLACES 206-001-339-005) (REPLACED BY 206-001-339-033)	1		F
96	206-001-339-033	..LEVER ASSY, PILOTS (USBL ON 206-001-345-001, . . . -003 AND -007) (REPLACES 206-001-339-005 AND -019)	1	1	N
96	206-001-400-005	..LEVER ASSY, PILOTS (USBL ON 206-001-345-009) . . . (REPLACED BY 206-001-400-101 AND -111)	1	0	
96	206-001-400-101	..LEVER ASSY, PILOTS (USBL ON 206-001-345-009) . . . (REPLACES 206-001-400-005) (REPLACED BY 206-001-400-111)	1		
96	206-001-400-111	..LEVER ASSY, PILOTS (USBL ON 206-001-345-009) . . . (REPLACES 206-001-400-005 AND -101)	1	1	
97	MS20200KP4	...BEARING (REPLACED BY MS27640-4)	2	0	
97	MS27640-4	...BEARING (REPLACES MS20200KP4)	2	1	
98	206-001-053-003	...BEARING (USBL ON 206-001-339-005)	1	0	B
98	206-001-053-005	...BEARING (USBL ON 206-001-339-019, -033 AND 206-001-400-005) (REPLACED BY 206-301-051-101)	1	1	F
98	206-301-051-101	...BEARING (REPLACES 206-001-053-005)	1	1	F
99	206-001-339-009	...SPACER (USBL ON 206-001-339-005, -019 AND -033)	1	6	N
99	214-001-905-013	...SPACER (USBL ON 206-001-400-005, -101 AND -111)	1	1	
100	206-001-338-001	..BEARING (REPLACED BY 206-001-338-101)	1	0	
100	206-001-338-101	..BEARING (REPLACES 206-001-338-001)	1	1	
101	206-001-346-001	..LEVER (REPLACED BY 206-001-346-003)	1		
101	206-001-346-003	..LEVER (REPLACES 206-001-346-001)	1	1	
102	AN4-6A	.BOLT	4	1	
103	AN960PD416	.WASHER (REPLACED BY AN960JD416)	4		
103	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	4		
103	NAS1149D0463J	.WASHER (REPLACES AN960JD416)	4		
104	AN525-10R6	.SCREW	3	1	
105	NAS1197-10	.WASHER	3	1	
106	206-001-356-003	.COVER, RIGGING FIXTURE (REPLACED BY 206-001-356-001)	1		D
106	206-001-376-001	.COVER, RIGGING FIXTURE (REPLACES 206-001-376-003)	1	1	

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic (Cont'd)			
107	206-001-360-001	.PIVOT SUPPORT ASSY	1		C
107	206-001-360-005	.PIVOT SUPPORT ASSY	1		L
108	206-001-397-001	.SUPPORT ASSY, PIVOT (REPLACED BY 206-001-397-101)	1		U
108	206-001-397-101	.SUPPORT ASSY, PIVOT (REPLACES 206-001-397-001) . .	1	1	U
109	AN503-6-6	..SCREW	2	1	
110	206-001-328-007	..SLEEVE	1	1	
		NOTE 1: LENGTH IS -22 OR -23 TO BE DETERMINED ON INSTALLATION.			
		USABLE ON CODES			
		CODE MODEL SERIAL NUMBER			
		A 206A 4-103			
		B 206A 4-153			
		C 206A 4-203			
		D 206A 4-583			
		E 206A 104-153			
		F 206A/B 4-1413			
		G 206A/B 4-1662			
		H 206A/B 4-2211			
		J 206A/B 304-1413			
		K 206A/B 584-1413			
		L 206A/B 204-1630, 1632-1651			
		M 206A/B/BIII 4-2622			
		N 206A/B/BIII 4-3566			
		P 206A/B/BIII 4-583, 1414-SUB			
		Q 206A/B/BIII 154-SUB			
		R 206A/B/BIII 204-SUB			
		S 206A/B/BIII 304-SUB			
		T 206A/B/BIII 584-SUB			
		U 206B/BIII 1631, 1652-SUB			
		V 206B/BIII 1414-SUB			
		W 206B/BIII 1663-SUB			
		X 206BIII 2212-SUB			
		Y 206BIII 2623-SUB			
		Z 206BIII 3567-SUB			
		1) UNLESS A USABLE ON PART NUMBER IS LISTED IN THE ITEM NAME COLUMN; NO CODE INDICATES THE PART APPLIES TO ALL SERIAL NUMBERS.			
		2) IF THE SERIAL NUMBER IS BLANK THE PART APPLIES TO ALL SERIAL NUMBERS FOR THAT MODEL.			

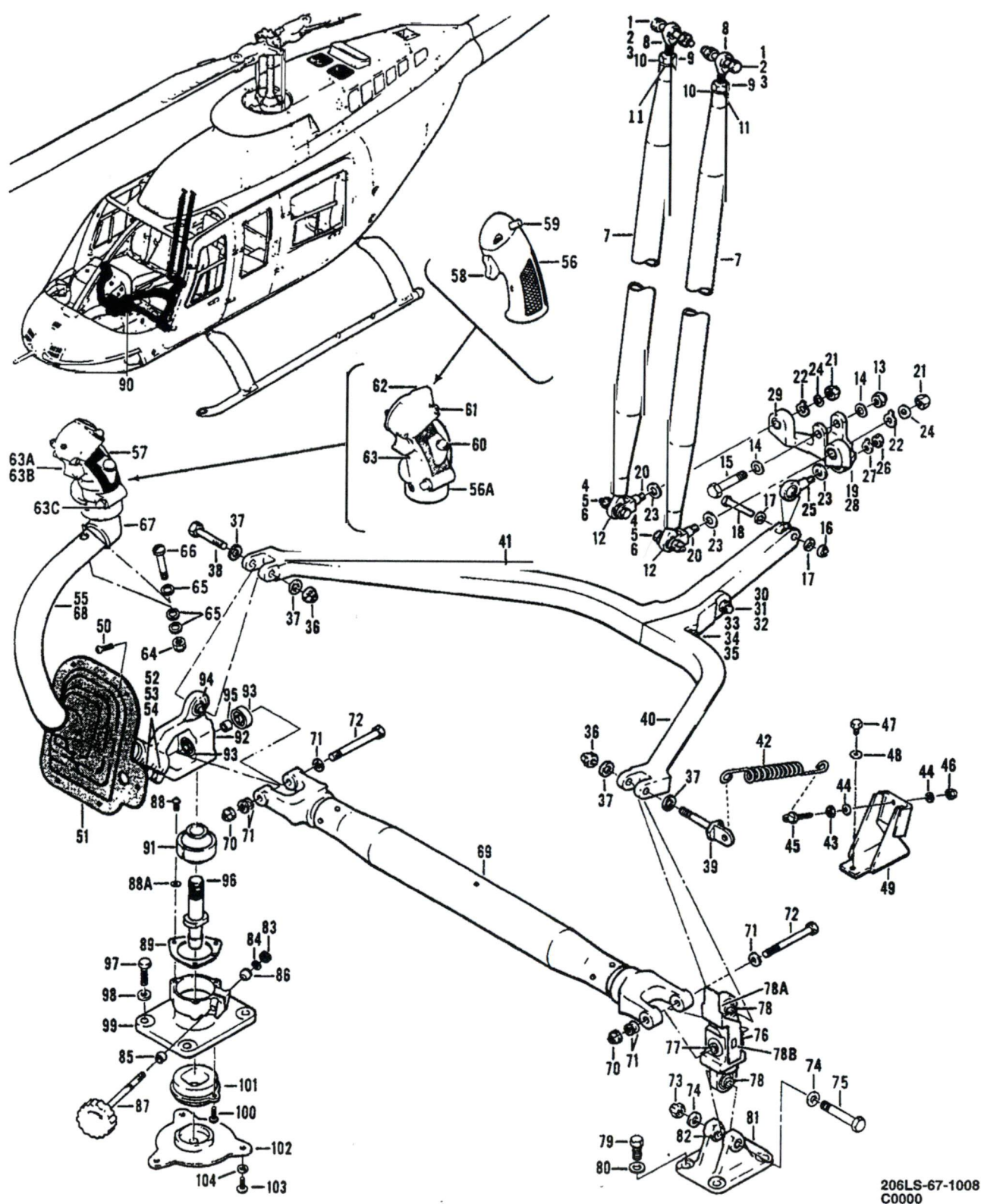


Figure 67-8. Controls installation, cyclic

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-8. Controls installation, cyclic			
	206-001-011-021	CONTROLS INSTL, CYCLIC	1		
	206-001-011-025	CONTROLS INSTL, CYCLIC	1		
	206-001-011-105	CONTROLS INSTL, CYCLIC	1		
	206-001-011-107	CONTROLS INSTL, CYCLIC	1		
1	MS17825-4	.NUT (REPLACED BY MS14144L4)	2	0	
1	MS14144L4	.NUT (REPLACES MS17825-4)	2	0	
2	NAS1197-416	.WASHER	2	1	
3	NAS1204-14D	.BOLT	2	1	
4	MS17825-4	.NUT (REPLACED BY MS14144L4)	2	0	
4	MS14144L4	.NUT (REPLACES MS17825-4)	2	0	
5	AN960-416L	.WASHER (REPLACED BY NAS1149F0432P)	2	1	
5	NAS1149F0432P	.WASHER (REPLACES AN960-416L)	2	1	
6	NAS1304-11D	.BOLT (REPLACED BY NAS6604D11)	2	0	
6	NAS6604D11	.BOLT (REPLACES NAS1304-11D)	2	0	
7	206-001-096-001	.TUBE ASSY	2	1	
8	206-001-052-001	.BEARING	1	1	
9	AN316-6R	.NUT	1	1	
10	AN960PD616	.WASHER (REPLACED BY AN960JD616) (REPLACED BY . . . NAS1149D0663J)	1		
10	AN960JD616	.WASHER (REPLACES AN960PD616) (REPLACED BY NAS1149D0663J)	1		
10	NAS1149D0663J	.WASHER (REPLACES AN960PD616 AND AN960JD616)	1		
	206-001-096-003	.TUBE ASSY	1	6	
11	214-001-024-001	.INSERT	1	1	
12	209-001-053-001	.BEARING	1	1	
13	MS17825-5	.NUT (REPLACED BY MS14144L5)	1		
13	MS14144L5	.NUT (REPLACES MS17825-5)	1		
14	AN960PD516	.WASHER (REPLACED BY AN960JD516) (REPLACED BY NAS1149D0563J)	2		
14	AN960JD516	.WASHER (REPLACES AN960PD516) (REPLACED BY NAS1149D0563J)	2		
14	NAS1149D0563J	.WASHER (REPLACES AN960PD516 AND AN960JD516)	2	1	
15	NAS1305-23D	.BOLT (REPLACED BY NAS6605D23)	1		
15	NAS6605D23	.BOLT (REPLACES NAS1305-23D)	1		
16	MS17826-4	.NUT (REPLACED BY MS14145L4)	1		
16	MS14145L4	.NUT (REPLACES MS17826-4)	1		
17	NAS1197-416	.WASHER	2	1	
18	NAS464P4-14	.BOLT	1	1	
19	206-001-363-009	.LEVER ASSY	1	1	A
19	206-001-300-001	.LEVER ASSY	1	1	BE
20	206-001-061-003	.CLEVIS	2	1	
21	MS17825-4	.NUT (REPLACED BY MS14144L4)	2	0	
21	MS14144L4	.NUT (REPLACES MS17825-4)	2	0	
22	206-001-067-003	.WASHER	2	1	
23	206-001-062-003	.WASHER	3	1	
24	120-003-16-9	.SHIM	1	1	
25	206-001-057-003	.BEARING	1	1	
26	MS17825-4	.NUT (REPLACED BY MS14144L4)	1	0	
26	MS14144L4	.NUT (REPLACES MS17825-4)	1	0	
27	206-001-067-003	.WASHER	1	1	

BHT-206L-SERIES-IPB

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-8. Controls installation, cyclic (Cont'd)			
28	206-001-363-005	.. LEVER ASSY (USBL ON 206-001-363-009)	1	1	
28	206-001-300-003	.. LEVER ASSY (USBL ON 206-001-300-001)	1	1	
29	206-001-405-001	... BUSHING (USBL ON 206-001-300-003)	3	1	
29	06DU08	... BUSHING (USBL ON 206-001-300-005)	3	1	
30	NAS679A4	. NUT (REPLACED BY MS21042L4)	1	0	
30	MS21042L4	. NUT (REPLACES NAS679A4)	1	0	
31	NAS1197-416	. WASHER	2	1	
32	AN4-17A	. BOLT	1	1	
33	NAS679A4	. NUT (REPLACED BY MS21042L4)	1	0	
33	MS21042L4	. NUT (REPLACES NAS679A4)	1	0	
34	NAS1197-416	. WASHER	2	1	
35	AN4-30A	. BOLT	1	1	
36	MS17825-5	. NUT (REPLACED BY MS14144L5)	2		
36	MS14144L5	. NUT (REPLACES MS17825-5)	2		
37	NAS1197-516	. WASHER	4	1	
38	NAS1305-22D	. BOLT (REPLACED BY NAS6605D22)	1		
38	NAS6605D22	. BOLT (REPLACES NAS1305-22D)	1		
39	206-001-380-003	. EYEBOLT	1	1	
40	206-001-322-003	. YOKE, LH	1	1	
41	206-001-323-001	. YOKE, RH	1	1	
42	206-001-402-001	. SPRING	1	1	
43	NAS671-10	. NUT	1	1	
44	AN960PD10L	. WASHER (REPLACED BY AN960JD10L) (REPLACED BY NAS1149D0232J)	2		
44	AN960JD10L	. WASHER (REPLACES AN960PD10L) (REPLACED BY NAS1149D0232J)	2		
44	NAS1149D0332J	. WASHER (REPLACES AN960PD10L AND AN960JD10L)	2		
45	206-001-745-003	. EYEBOLT ASSY	1	1	
46	NAS679A3	. NUT (REPLACED BY MS21042L3)	1		
46	MS21042L3	. NUT (REPLACES NAS679A3)	1		
47	AN3-3A	. BOLT	2	1	
48	AN960PD10	. WASHER (REPLACED BY AN960JD10) (REPLACED BY NAS1149D0363J)	1		
48	AN960JD10	. WASHER (REPLACES AN960PD10) (REPLACED BY NAS1149D0363J)	1		
48	NAS1149D0363J	. WASHER (REPLACES AN960PD10 AND AN960JD10)	1		
49	206-001-379-001	. BRACKET ASSY	1	1	
50	AN525-832R6	. SCREW	6	1	
51	206-001-361-045	. BOOT ASSY	1	1	
52	NAS679A4	. NUT (REPLACED BY MS21042L4)	2	0	
52	MS21042L4	. NUT (REPLACES NAS679A4)	2	0	
53	AN960PD416	. WASHER (REPLACED BY AN960JD416) (REPLACED BY NAS1149D0463J)	4		
53	AN960JD416	. WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	4		
53	NAS1149D0463J	. WASHER (REPLACES AN960PD416 AND AN960JD416)	4		
54	AN4-21A	. BOLT	2	1	
55	206-001-344-001	. STICK ASSY (USBL ON 206-001-011-021 AND -025) . . .	1	0	C
55	206-001-344-101	. STICK ASSY (USBL ON 206-001-011-105)	1		D
55	206-001-344-105	. STICK ASSY (USBL ON 206-001-011-107)	1		E

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-8. Controls installation, cyclic (Cont'd)			
56	206-001-359-001	..GRIP ASSY (USBL ON 206-001-344-001 AND -101) . . . (ALTERNATE PART)	1	1	
56A	21110-1	..GRIP ASSY (IFR EQUIPPED SHIPS ONLY) (REPLACED . . BY PM22700)	1	0	
56A	PM22700	..GRIP ASSY (IFR EQUIPPED SHIPS ONLY) (REPLACES . . 21110-1)	1	1	
57	205-001-046-101	..GRIP ASSY (USBL ON 206-001-344-105)	1	1	
58	90-0367	...SWITCH (USBL ON 206-001-359-001)	1		
59	90-370	...SWITCH (USBL ON 206-001-359-001)	1	1	
60	PM22694	...SWITCH (IFR EQUIPPED SHIPS ONLY) (USBL ON PM22700 AND 21110-1)	1	1	
61	PM21953	...SWITCH (IFR EQUIPPED SHIPS ONLY) (USBL ON PM22700 AND 21110-1)	1	1	
62	MS27708-3	...SWITCH (IFR EQUIPPED SHIPS ONLY) (USBL ON PM22700 AND 21110-1)	1	1	
63	PM21230-2	...SWITCH (IFR EQUIPPED SHIPS ONLY) (USBL ON PM22700 AND 21110-1)	1	1	
63A	PM21230-2	...SWITCH (USBL ON 205-001-046-101)	1	1	
63B	21223	...TRIGGER SWITCH (USBL ON 206-001-046-101)	1	1	
63C	MS25089-4A	...SWITCH (USBL ON 206-001-046-101)	1	1	
64	22K2-048	..NUT (REPLACED BY 90-003-40)	1		
64	90-003-40	..NUT (REPLACES 22K2-048)	1		
65	AN960PD416	..WASHER (NOTE 1) (REPLACED BY AN960JD416) (REPLACED BY NAS1149D0463J)	3		
65	AN960JD416	..WASHER (NOTE 1) (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	3		
65	NAS1149D0463J	..WASHER (REPLACES AN960PD416 AND AN960JD416)	3		
66	AN24-26A	..BOLT	1	1	
67	206-001-343-001	..ELBOW (USBL ON 206-001-344-001 AND -101)	1		
67	206-001-343-003	..ELBOW (USBL ON 206-001-344-105)	1	1	
68	206-001-342-001	..TUBE ASSY (USBL ON 206-001-344-001)	1	1	
68	206-001-342-101	..TUBE ASSY (USBL ON 206-001-344-101 AND -105)	1	1	
69	206-001-306-013	..TUBE ASSY, TORQUE	1	1	
70	MS17825-4	..NUT (REPLACED BY MS14144L4)	2	0	
70	MS14144L4	..NUT (REPLACES MS17825-4)	2	0	
71	AN960PD416	..WASHER (REPLACED BY AN960JD416) (REPLACED BY NAS1149D0463J)	6		
71	AN960JD416	..WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	6		
71	NAS1149D0463J	..WASHER (REPLACES AN960PD416 AND AN960JD416)	6		
72	20-057-4-42D	..BOLT	2	1	
73	MS17826-5	..NUT (REPLACED BY MS14145L5)	1	0	
73	MS14145L5	..NUT (REPLACES MS17826-5)	1	0	
74	NAS1197-516	..WASHER	2	1	
75	NAS1305-28D	..BOLT (REPLACED BY NAS6605D28)	1		
75	NAS6605D28	..BOLT (REPLACES NAS1305-28D)	1		
76	206-001-400-009	..LEVER ASSY (REPLACED BY 206-001-400-115)	1		
76	206-001-400-115	..LEVER ASSY (REPLACES 206-001-400-009)	1	1	
77	206-001-053-005	..BEARING (USBL ON 206-001-400-009) (REPLACED BY 206-301-051-101)	1	1	

BHT-206L-SERIES-IPB

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) C O C
		FIGURE: 67-8. Controls installation, cyclic (Cont'd)			
77	206-301-051-101	..BEARING (REPLACES 206-001-053-005)	1	1	
78	MS27640-4	..BEARING	2	1	
78A	206-001-340-001	..SHIELD	1	6	
78B	214-001-905-013	..SPACER	1	1	
79	AN4-5A	.BOLT	4	1	
80	NAS1197-416	.WASHER	4	1	
81	206-001-330-001	.SUPPORT ASSY, PIVOT	1	1	
82	22-007-19-31-18	..BUSHING	2	1	
83	206-001-351-001	.NUT	1	1	
84	AN960PD416	.WASHER (NOTE 2) (REPLACED BY AN960JD416) (REPLACED BY NAS1149D0463J)	8		
84	AN960JD416	.WASHER (NOTE 2) (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	8		
84	NAS1149D0463J	.WASHER (REPLACES AN960PD416 AND AN960JD416)	8		
85	SL50-5ASP6	.NUT	1	1	
86	SL50-4ASP5	.NUT	1	1	
87	206-001-396-001	.SHAFT ASSY	1	1	
88	AN525-10R6	.SCREW	3	1	
88A	AN960PD10L	.WASHER (REPLACED BY AN960JD10L) (REPLACED BY NAS1149D0332J)	1		
88A	AN960JD10L	.WASHER (REPLACES AN960PD10L) (REPLACED BY NAS1149D0332J)	1		
88A	NAS1149D0332J	.WASHER (REPLACES AN960PD10L AND AN960JD10L)	1		
89	206-001-349-001	.RETAINER	1	1	
90	206-001-345-009	.PIVOT ASSY	1	1	
91	206-001-338-001	..BEARING (REPLACED BY 206-001-338-101)	1	0	
91	206-001-338-101	..BEARING (REPLACES 206-001-338-001)	1	1	
92	206-001-400-005	..LEVER ASSY (REPLACED BY 206-001-400-101)	1	0	
92	206-001-400-101	..LEVER ASSY (REPLACES 206-001-400-005)	1		
93	MS27640-4	..BEARING	2	1	
94	206-001-053-005	..BEARING (USBL ON 206-001-400-005) (REPLACED . . . BY 206-301-051-101)	1	1	
94	206-301-051-101	..BEARING (REPLACES 206-001-053-005)	1	1	
95	214-001-905-013	..SPACER	1	1	
96	206-001-346-001	..LEVER (REPLACED BY 206-001-346-003)	1		
96	206-001-346-003	..LEVER (REPLACES 206-001-346-001)	1	1	
97	AN4-6A	.BOLT	4	1	
98	AN960PD416	.WASHER (REPLACED BY AN960JD416) (REPLACED BY NAS1149D0463J)	4		
98	AN960JD416	.WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	4		
98	NAS1149D0463J	.WASHER (REPLACES AN960PD416 AND AN960JD416)	4		
99	206-001-397-001	.SUPPORT ASSY (REPLACED BY 206-001-397-101)	4		
99	206-001-397-101	.SUPPORT ASSY (REPLACES 206-001-397-001)	1	1	
100	AN503-6-6	..SCREW	2	1	
101	206-001-328-007	..SLEEVE	1	1	
102	206-001-376-001	.COVER	1	1	
103	AN525-10R6	.SCREW	3	1	
104	NAS1197-10	.WASHER	3	1	

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C																		
		<p>FIGURE: 67-8. Controls installation, cyclic (Cont'd)</p> <p>NOTE 1: INSTALL ONE UNDER BOLT HEAD AND TWO UNDER NUT</p> <p>NOTE 2: REFER TO BHT-206L3-MM FOR USAGE</p> <p>NOTE 3: 45104-SUB, 46601-SUB, 51001-SUB</p> <p>USABLE ON CODES</p> <table><tr><td>CODE</td><td>MODEL</td><td>SERIAL NUMBER</td></tr><tr><td>A</td><td>206L</td><td>45004-45103</td></tr><tr><td>B</td><td>206L/L1/L3</td><td>SEE NOTE 3</td></tr><tr><td>C</td><td>206L/L1</td><td></td></tr><tr><td>D</td><td>206L3</td><td>51001-SUB</td></tr><tr><td>E</td><td>206L4</td><td></td></tr></table> <p>1) UNLESS A USABLE ON PART NUMBER IS LISTED IN THE ITEM NAME COLUMN; NO CODE INDICATES THE PART APPLIES TO ALL SERIAL NUMBERS.</p> <p>2) IF THE SERIAL NUMBER IS BLANK THE PART APPLIES TO ALL SERIAL NUMBERS FOR THAT MODEL.</p>	CODE	MODEL	SERIAL NUMBER	A	206L	45004-45103	B	206L/L1/L3	SEE NOTE 3	C	206L/L1		D	206L3	51001-SUB	E	206L4				
CODE	MODEL	SERIAL NUMBER																					
A	206L	45004-45103																					
B	206L/L1/L3	SEE NOTE 3																					
C	206L/L1																						
D	206L3	51001-SUB																					
E	206L4																						

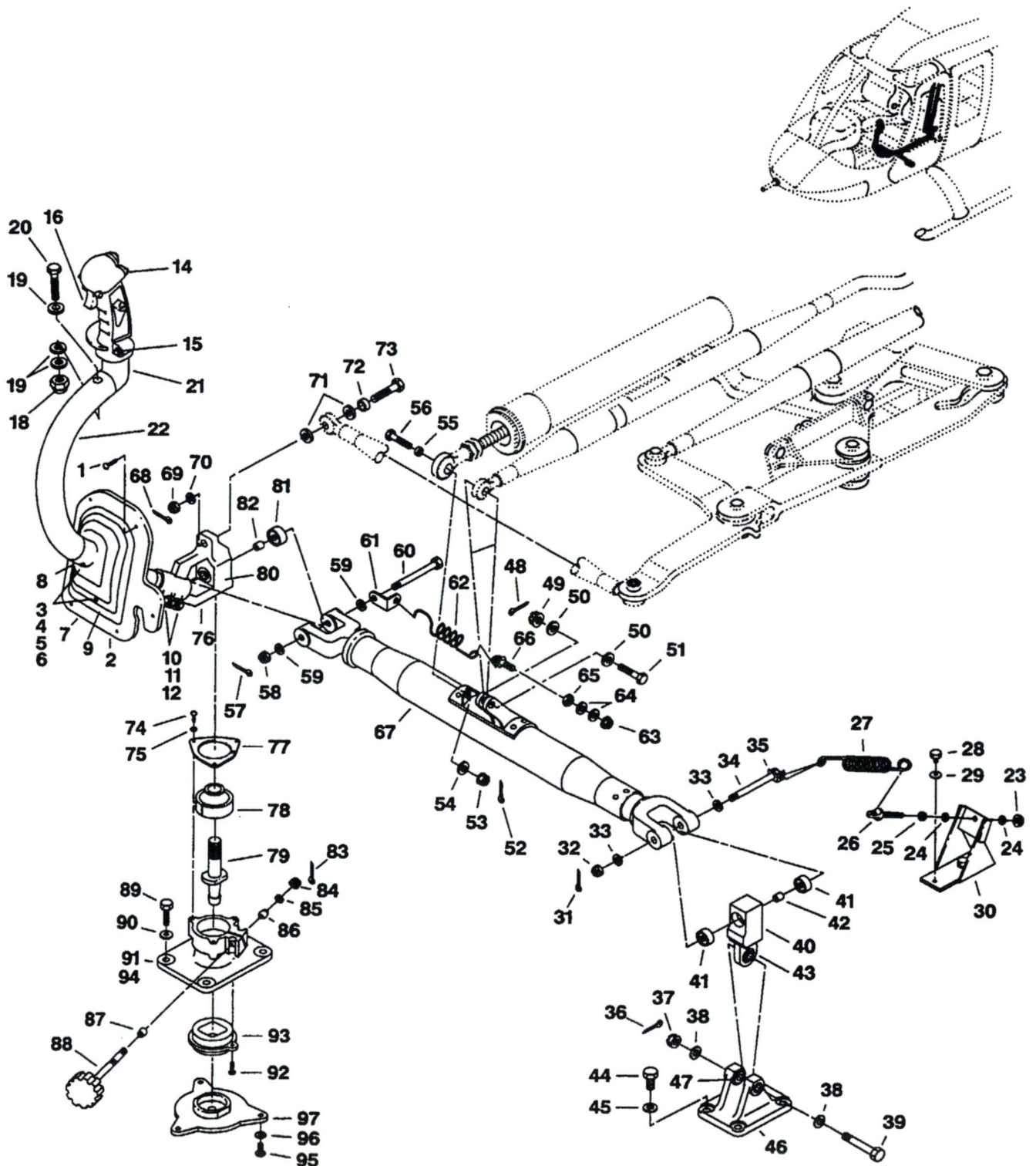


Figure 67-8. Controls installation, cyclic cockpit

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(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-8. Controls installation, cyclic cockpit			
	407-001-003-103	CONTROLS INSTL, CYCLIC COCKPIT (SEE FIG. 9 FOR BALANCE OF BREAKDOWN)	1	NP	
1	AN525-832R10	.SCREW	6	SP	
2	206-001-361-103	.BOOT ASSY, CYCLIC STICK (S/N 53000, 53001, 53060 . . THRU SUB)	1	SP	
2	206-001-361-045	.BOOT ASSY, CYCLIC STICK (S/N 53002 THRU 53059)	1	SP	
3	AN227-14B	..EYELET (REPLACES AN227-14B)	2	NP	
3	MS27981-5B	..EYELET (REPLACES AN227-14B)	2	SP	
4	AN227-13B	..STUD (REPLACES BY MS27981-4B)	2	NP	
4	MS27981-4B	..STUD (REPLACES AN227-13B)	2	SP	
5	AN227-12B	..SOCKET	2	SP	
6	AN227-11B	..BUTTON (REPLACES BY MS27981-1B)	2	NP	
6	MS27981-1B	..BUTTON (REPLACES AN227-11B)	2	SP	
7	206-001-361-117	..STIFFENER, BOOT ASSY (USBL ON 206-001-361-103) . .	1	P	
7	206-001-361-047	..STIFFENER, BOOT ASSY (USBL ON 206-001-361-045) . .	1		
8	206-001-361-043	..COLLAR, BOOT ASSY	1		
9	206-001-361-105	..BOOT BODY, BOOT ASSY (USBL ON 206-001-361-103) . .	1		
9	206-001-361-041	..BOOT BODY, BOOT ASSY (USBL ON 206-001-361-045) . .	1	NP	
10	MS21042L4	.NUT	2	SP	
11	NAS1149D0463J	.WASHER	4	SP	
12	NAS6604-27	.BOLT	2	SP	
		(ALTERNATE PART)			
12	20-057-4-27D	.BOLT	2	SP	
13	DELETED			
	206-001-344-105	.STICK ASSY, CYCLIC CONTROLS (S/N 53000 THRU 53172)	1		
	206-001-344-109	.STICK ASSY, CYCLIC CONTROLS (S/N 53173 THRU SUB) . .	1	P	
14	205-001-046-101	..GRIP ASSY, CYCLIC STICK (USBL ON 201-001-344-105)	1	SP	
14	205-001-046-115	..GRIP ASSY, CYCLIC STICK (USBL ON 206-001-344-109)	1	SP	
15	21223	...SWITCH, TRIGGER (REFERENCE DESIGNATOR 4A5S3) . . .	1	SP	
16	PM21230-2	...SWITCH, ICS/RADIO (REFERENCE DESIGNATOR 2303S1)	1	SP	
17	DELETED			
18	22K2-048	..NUT (REPLACES BY 90-003-40)	1	NP	
18	90-003-40	..NUT (REPLACES 22K2-048)	1	SP	
19	AN960PD416	..WASHER (REPLACES BY AN960JD416)	3	NP	
19	AN960JD416	..WASHER (REPLACES AN960PD416) (REPLACES BY NAS1149D0463J)	3	P	
19	NAS1149D0463J	..WASHER (REPLACES AN960JD416)	3	SP	
20	AN24-26A	..BOLT	1	SP	
21	206-001-343-003	..ELBOW, CYCLIC STICK	1	SP	
22	206-001-342-101	..TUBE ASSY, CYCLIC STICK	1	SP	
23	MS21042L3	.NUT	1	SP	
24	NAS1149D0332J	.WASHER	2	SP	
25	NAS671-10	.NUT	1	SP	
26	206-001-745-003	.EYEBOLT ASSY, CYCLIC STICK	1	SP	
27	206-001-402-001	.SPRING, CYCLIC STICK, BALANCE	1	SP	

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-8. Controls installation, cyclic cockpit (Cont'd)			
28	MS27039-1-08	.SCREW	2	SP	
29	NAS1149D0363J	.WASHER	2	SP	
30	206-001-379-001	.BRACKET ASSY, CYCLIC STICK, BALANCE, SPRING	1	SP	
31	MS24665-151	.PIN	1	SP	
32	MS14144L4	.NUT	1	SP	
		(ALTERNATE PART)			
32	RME9868-4	.NUT	1	SP	
33	NAS1149D0463J	.WASHER	2	SP	
34	20-057-4-44D	.BOLT	1	SP	
		(ALTERNATE PART)			
34	NAS6604-44	.BOLT	1	SP	
35	20-032-3C	.BRACKET, BALANCING SPRING	1	SP	
36	MS24665-155	.PIN, COTTER	1	SP	
37	MS14144L5	.NUT	1	SP	
		(ALTERNATE PART)			
37	RME9868-5	.NUT	1		
38	NAS1149D0563J	.WASHER	2	SP	
39	20-057-5-30D	.BOLT	1	SP	
		(ALTERNATE PART)			
39	NAS6604-30	.BOLT	1	SP	
40	407-001-320-105	.LEVER ASSY, CPLT	1	SP	
41	MKP4	.BEARING	2	SP	
42	214-001-905-013	.SPACER	1	SP	
43	206-301-051-101	.BEARING	1	SP	
44	NAS6604-4	.BOLT	4	SP	
		(ALTERNATE PART)			
44	20-057-4-4D	.BOLT	4		
45	NAS1149D0463J	.WASHER	4	SP	
46	407-001-312-101	.SUPPORT ASSY, PIVOT, CPLT	1	SP	
47	20-007-19-31-18	.BUSHING	2	SP	
48	MS24665-151	.PIN	1	SP	
49	MS14144L4	.NUT	1	SP	
		(ALTERNATE PART)			
49	RME9868-4	.NUT	1	SP	
50	NAS1149D0463J	.WASHER	2	SP	
51	20-057-4-23D	.BOLT	1	SP	
		(ALTERNATE PART)			
51	NAS6604-23	.BOLT	1	SP	
52	MS24665-151	.PIN	1	SP	
53	MS14144L4	.NUT	1	SP	
		(ALTERNATE PART)			
53	RME9868-4	.NUT	1	SP	
54	NAS1149D0463J	.WASHER	1	SP	
55	50Z12-9-2	.SPACER	1	SP	
56	20-057-4-13D	.BOLT	1	SP	
		(ALTERNATE PART)			
56	NAS6604-13	.BOLT	1	SP	
57	MS24665-151	.PIN	1	SP	
58	MS14144L4	.NUT	1	SP	

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U C O C
		FIGURE: 67-8. Controls installation, cyclic cockpit (Cont'd)			
		(ALTERNATE PART)			
58	RME9868-4	.NUT	1	SP	
59	NAS1149D0463J	.WASHER	2	SP	
60	20-057-4-44D	.BOLT	1	SP	
		(ALTERNATE PART)			
60	NAS6604-44	.BOLT	1	SP	
61	20-032-3C	.BRACKET, BALANCING SPRING	1	SP	
62	206-001-377-001	.SPRING	1	SP	
63	MS21042L3	.NUT	1	SP	
64	NAS1149D0332J	.WASHER	2	SP	
65	NAS671-10	.NUT	1	SP	
66	206-001-745-001	.EYEBOLT ASSY, CYCLIC STICK	1	SP	
67	407-001-300-101	.TUBE ASSY, TORQUE, CYCLIC CONTROLS	1	SP	
68	MS24665-151	.PIN	1	SP	
69	MS14144L4	.NUT	1	SP	
		(ALTERNATE PART)			
69	RME9868-4	.NUT	1	SP	
70	NAS1149D0463J	.WASHER	1	SP	
71	140-009D17T26	.WASHER	2	SP	
72	50Z12-9-2	.SPACER	1	SP	
73	20-057-4-16D	.BOLT	1	SP	
		(ALTERNATE PART)			
73	NAS6604-16	.BOLT	1	SP	
74	MS27039-1-06	.SCREW	3	SP	
75	NAS1149D0363J	.WASHER	3	SP	
76	407-001-301-101	.PIVOT ASSY	1	SP	
77	206-001-349-001	.RETAINER	1	SP	
78	206-001-338-101	.BEARING	1	SP	
79	407-001-341-101	.LEVER	1	SP	
80	407-001-320-101	.PIVOT ASSY, PLT, CYCLIC STICK	1	SP	
81	MKP4	.BEARING	2	SP	
82	214-001-905-013	.SPACER	1	SP	
83	MS24665-155	.PIN, COTTER	1	SP	
84	206-001-351-001	.NUT	1	SP	
85	NAS1149D0463J	.WASHER	1	SP	
86	SL50-4ASP5	.NUT, BARREL	1	SP	
87	SL50-5ASP6	.NUT, BARREL	1	SP	
88	206-001-396-001	.SHAFT ASSY	1	SP	
89	NAS6604-4	.BOLT	4	SP	
		(ALTERNATE PART)			
89	20-057-4-4D	.BOLT	4		
90	NAS1149D0463J	.WASHER	4	SP	
91	206-001-397-105	.PIVOT SUPPORT ASSY, CYCLIC FRICTION	1	SP	
92	AN503-6-6	.SCREW	2	SP	
93	407-001-342-101	.SLEEVE	1	SP	
94	206-001-397-103	.PIVOT SUPPORT, CYCLIC FRICTION	1		
95	MS27039-1-08	.SCREW	3	SP	
96	NAS1149D0363J	.WASHER	3	SP	
97	206-001-376-001	.COVER, RIGGING, CYCLIC CONTROLS	1	SP	

(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		<p>FIGURE: 67-8. Controls installation, cyclic cockpit (Cont'd)</p> <p>AVAIL CODE DEFINITION</p> <p>P Procurable NP Non Procurable SP Normal stock/procurable See introduction on availability codes for additional information.</p>			